# A STUDY OF LEACHATE GENERATED FROM CONSTRUCTION AND DEMOLITION LANDFILLS

by

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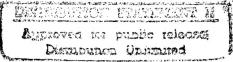
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#### **EXECUTIVE SUMMARY**

Construction and demolition (C&D) waste landfills have largely been ignored because they have been viewed as innocuous in comparison to municipal solid waste (MSW) landfills and hazardous waste landfills. Regulators felt that since C&D landfills did not accept large quantities of hazardous waste and the waste was relatively stable in comparison to MSW, these landfills did not pose a threat to the environment. Thus, little is known about leachate generated from C&D landfills because they have not been well studied.

Based on the results of a statistical analysis, the following parameters in C&D leachate could present a risk to human health and the environment because they exceed either primary groundwater standards, secondary groundwater standards, or guidance concentrations for groundwater:

Methylene Chloride 1,2-Dichloroethane Cadmium Lead Iron Total Dissolved Solids

Some degradation of groundwater could occur because of the presence of these contaminants. It cannot be determined how far the contaminants will spread from a disposal site. There is a high probability groundwater monitoring wells will contain iron, manganese, and total dissolved solids in excess of the groundwater standards because of the extremely high levels of these contaminants in C&D leachate. It cannot be determined if the remaining parameters will be found in groundwater monitoring wells above the applicable standards.

Manganese

Sulfate

Standards for C&D landfills should include financial assurance, groundwater monitoring, corrective action, and location restrictions similar to the standards applicable to MSW landfills. Because of the risk for damage to human health and the environment, C&D landfills should be required to prove that they have the financial resources to mitigate any damage caused by the C&D landfill. Groundwater monitoring should be required to protect the groundwater resources. and if damage occurs, corrective action is needed to mitigate the damage. Location restrictions would protect against release of solid waste in unstable areas.

There is insufficient data concerning volatile organics, semi-volatile organics, and other organics such as pesticides and herbicides, therefore further research is required to determine if these classes of contaminants are present in sufficient amounts to endanger human health and the environment.

#### 1.0 INTRODUCTION

### 1.1 Background

The proper design of a solid waste landfill includes the consideration of leachate generation and its potential impact on human health and the environment. Leachate is the liquid that has percolated through the waste in a landfill and has extracted dissolved or suspended solids from the waste (Tchobanoglous et al. 1993). Considerable research has been conducted on leachate generated from municipal solid waste (MSW) landfills, therefore, this leachate is well characterized. MSW landfills generally accept all waste generated in the community with the exception of industrial and agriculture waste (Tchobanoglous et al. 1993). Construction and Demolition (C&D) waste landfills are a special category of solid waste landfills. C&D waste landfills accept a wide variety of waste generated by construction and demolition activities. C&D waste landfills have been largely ignored because they were viewed as innocuous in comparison to MSW landfills and hazardous waste landfills. Regulators felt that since C&D waste landfills did not accept hazardous waste except for hazardous waste that could not be physically separated, and since the waste was relatively stable in comparison to MSW, these landfills posed a minimal threat to the environment. Researchers have largely ignored C&D waste landfills because of this pervasive attitude. Thus, little is known about leachate generated from C&D waste landfills because these landfills have not been well studied.

The 1984 amendments to the Resource Conservation and Recovery Act (RCRA) required the U. S. Environmental Protection Agency (EPA) to revise the existing standards governing management of household hazardous waste and hazardous waste from small quantity generators (EPA 1995). In 1991, regulators at the EPA issued revised criteria for MSW landfills that receive these two classes of hazardous waste. The revised criteria did not apply to non-MSW landfills. The EPA was subsequently sued for ignoring non-MSW landfills. The EPA has since issued proposed standards for non-MSW landfills (EPA 1995). It is anticipated that the new regulations will impact C&D waste landfills the greatest. Concurrent to EPA's proposed rule development, the State of Florida has developed rules to address the management of C&D waste in the state. Despite the new regulatory attention paid to C&D waste disposal operations, the basic question

remains: To what extent does leachate from C&D waste represent a threat to human health and the environment?

# 1.2 Composition of C&D Waste

This study does not focus on the composition of C&D waste, but a brief introduction is appropriate so that leachate generated from this waste can be better understood. C&D waste is defined as "all waste resulting from the construction, renovation and demolition of buildings, roads, bridges, docks, piers, and all other structures (Spencer 1991)." The definition of C&D waste also shows the many sources of C&D waste. C&D waste comes from residential, commercial, industrial, and governmental activities. The major components of C&D waste are wood products, cardboard and other paper products, concrete and asphalt, plastics, metals, roofing materials, dirt and vegetation from landclearing operations, and other miscellaneous materials including carpeting, drywall, insulation, flashing, tile, and empty containers.

Most of the waste is relatively inert, however C&D waste also contains wastes that may be hazardous (EPA 1995). The hazardous waste either cannot be removed from the non-hazardous constituents (paint, sealants), or is mixed with the C&D waste and is not identified by inspectors at the C&D waste landfills (paint cans, caulking tubes). The potentially hazardous materials can be divided into four categories: 1) excess materials and their containers, 2) waste oils, grease, and fluids, 3) other discrete items such as batteries, fluorescent bulbs, and appliances, and 4) inseparable constituents of bulk items (EPA 1995). Excess materials include paint cans with excess paint, caulking compounds, sealants, and fillers. Residual amounts of these items are often left in their containers and discarded into the dumpster. Discrete items like batteries and bulbs contain trace amounts of mercury and other heavy metals that may leach into the ground after disposal. Inseparable constituents of bulk items refer to paints, sealants, and preservatives that are applied to wood and metal surfaces. These paints and sealants cannot be removed from the bulk item once they are applied. Heavy metals and semi-volatile organic compounds are often a major constituent of these paints and sealants. These contaminants are released into water as it flows over the bulk item in a landfill. Leachate which is generated from any of these categories of C&D waste has the potential to contain harmful concentrations of the hazardous constituents found in the waste. Because these small quantities of hazardous waste are found in C&D waste, this waste can no longer be ignored and classified as innocuous.

A study of three C&D waste landfills in the Houston, Texas, area concluded that over half of the total waste stream consists of wood, brush, and grass (Norstrom et al. 1991). These wastes decompose rapidly which can cause the formation of organic acids, high oxygen demand, and high organic content in C&D leachate. Paper and cardboard made up between 2 and 13 percent. These materials will decompose less rapidly than the wood and brush. Concrete, rock, asphalt, and soil made up 15 percent of the waste. Metals made up six percent by volume of the waste. Various metals in the waste cause elevated levels of heavy metals, iron, and manganese. Rubber, plastic, and glass composed between 2 and 9 percent. Miscellaneous items such as roofing materials, carpet, insulation, and drywall composed between 4 and 19 percent of C&D waste.

The materials found at the Houston landfills are typical at C&D waste landfills. However, the percentages expressed in the study by Norstrom et al. cannot be considered to by typical of all C&D waste landfills. C&D waste composition can vary greatly depending on the bans in place, the type of industry in the area, and the dumping fees for the C&D waste landfill. One of the largest effects will be bans on landclearing debris, grass and other materials that degrade easily. When these bans are in place, the oxygen demand and nitrogen loading should decrease (Hamel 1989). Such a ban may also result in an increase in the concentration of heavy metals and other contaminants. As the amount of landclearing debris in the waste is reduced, the other types of material will make up a larger percentage of C&D waste. The increasing percentage of metals, gypsum wall board, cement and other materials will increase the amount of metals, sulfate, sodium, potassium and other contaminants in the leachate. The type of industry in the vicinity of the landfill will also affect the composition of C&D waste. For example, in an area that is rapidly expanding, a greater portion of the waste stream will come from new construction. New construction will tend to have higher concentrations of wood, gypsum board, and containers containing sealants, caulking and chemical products. If an area is fully developed, quite a bit of renovation work is expected. This could include road work. Demolition wastes from renovation can include lead-based paint, asbestos, concrete and asphalt. Demolition debris will be higher in these materials than in new construction. Thus, the type of industry in an area can significantly impact the composition of C&D waste. Finally, the fees that landfills charge can affect the composition of the waste. If two C&D waste landfills operate in the same geographical area, and

one charges significantly lower tipping fees, more of the heavy debris could end up in the landfill with the lower tipping fee. This could shift the composition in both landfills as the landfill with the higher tipping fees gets less heavy materials such as concrete, and the landfill with the lower tipping fees receiving more heavy materials.

In conclusion, the composition of C&D waste is highly variable. The specific composition will depend on the bans in place, industry in the area of the landfill, and the dump or tip fees charged at the landfill.

# 1.3 Scope of Project

C&D waste is a potential problem because it may contain small quantities of hazardous waste. Because of this, in the past several years C&D waste landfills have received renewed attention from state and local regulators. However, many aspects of C&D waste and C&D waste landfills are still unknown. The University of Florida recently began a project which will investigate some of the unknown aspects of C&D waste. The scope of the project includes characterizing the composition of C&D waste, conducting a full review of C&D waste landfills in the State of Florida, and investigating C&D leachate through a lysimeter study. There is limited data available on the composition of leachate generated from C&D waste landfills. A complete review of the limited data is needed to determine what components will be expected to represent a problem. This project reviews the available data on leachate generated from C&D waste landfills and presents a statistical analysis of the data. This project includes a complete literature review of the major leachate studies, a detailed description of the method taken to analyze the data, a thorough analysis of the statistical results, and conclusions and recommendations.

#### 2.0 LITERATURE REVIEW

#### 2.1 Introduction

There are a small number of reports and other documents that have addressed the composition of leachate from C&D waste landfills. The following sections summarize these reports and documents. The largest amount of information came from the report produced for the National Association of Demolition Contractors. However, this report only gathered, not analyzed, the data. The report produced for Waste Management Incorporated contains the most extensive round of sampling and a complete analysis of the data. As part of its rulemaking process, the EPA prepared a report that summarizes the existing database of leachate from C&D waste landfills, including the reports mentioned above.

The work presented here summarizes available leachate data from C&D waste landfills. Since many of the sources of data have been presented in many different reports, the data presented here are referenced to the original source report when possible. The data are from sources believed to be leachate, not groundwater contaminated with leachate. Such sources include leachate collection systems from lined landfills, leachate seeps, and wells within the C&D waste. The data are analyzed in a later chapter. The sampling results for all of the reports discussed in the following sections are located in Appendix A. The depth of analysis presented in this report is greater than any previous study.

#### 2.2 The National Association of Demolition Contractors Study

The National Association of Demolition Contractors (NADC) hired the consultant firm of Gershman, Bricker & Bratton (GBB) to examine the appropriate management and/or disposal techniques for C&D waste. Because leachate quality from C&D waste landfills has never been adequately researched, GBB decided to investigate the environmental history of rubble fills or C&D waste landfills around the country. GBB sent letters to each State requesting information and data on any leachate test results submitted to the state as part of operational monitoring activities. The responses to these letters make up Volume I of the NADC report, which is entitled "Specific State-by-State Responses" (NADC 1994). The following states sent leachate data from operational C&D landfills: Colorado, Connecticut, Iowa, New York, South Carolina, and Washington. Minnesota, North Dakota, and Delaware sent groundwater monitoring results only.

The groundwater monitoring results were not included in this investigation because contaminants in the groundwater are greatly diluted from raw leachate. The diluted concentrations could skew the results of the raw leachate data, making the mean and median values for the contaminants smaller and, therefore, not representative of leachate quality. The landfills that were included in Volume I of the NADC report and had leachate quality data are given in Table 2.1. The results of these surveys are included in Appendix A.

Table 2.1: Landfills from Volume I of NADC Report

| NAME OF LANDFILL                    | LOCATION                | NO. OF LEACHATE SAMPLES |
|-------------------------------------|-------------------------|-------------------------|
| Construction Disposal Inc. Landfill | Adams County, Colorado  | 1                       |
| Mt. Olivet Landfill                 | King County, Washington | 2                       |
| 110 Sand Co. C&D Debris Landfill    | Melville, New York      | 20                      |
| Blydenburg Cleanfill                | Islip, New York         | 4                       |
| Unknown Site                        | South Carolina          | 1                       |

Volume II of the NADC report is entitled "Copies of Reports, Articles, and Other Related Data" (NADC 1994). There are five reports not written by GBB that are included in Volume II. Because four of the five reports were written by other groups or individuals, they are reported as separate literature sources in this paper. Only the response provided by Brandywine Enterprises, Inc. is discussed in this section. Brandywine Enterprises Inc. reported leachate quality data from their C&D landfill, the Cross Trails Rubble Landfill in Maryland. They did not include any information concerning the characteristics of the landfill. Because Brandywine Enterprises reported volume of leachate collected and disposed, it is reasonable to assume that the landfill has a leachate collection system. Since landfills with leachate collection systems normally have liners, it can also be assumed that the landfill is lined. This second assumption is less certain than the first. No other information was provided by Brandywine Enterprises.

The NADC report concluded that a "vast majority of waste received by demolition landfills is relatively inert" (NADC 1994). The investigators were convinced that leachate from state-of-the-art demolition landfills and MSW landfills are not similar in concentration or composition, therefore, they should not be regulated in a similar manner. They recommend that all C&D landfills should have: 1) trained personnel who inspect all incoming waste loads for unsuitable

waste, 2) leachate containment system consisting of either suitable soil conditions, compaction of suitable soil, or other containment system, 3) groundwater monitoring system, and 4) financial assurance. The authors conclude that C&D landfills that follow these guidelines will not pose a significant threat to the environment.

# 2.3 Waste Management Incorporated Study

This is the report from the third year of an ongoing study conducted by Waste Management of North America (WMI) (Waste Management Inc. 1993). The purpose of the study is to characterize the composition of leachate from C&D waste landfills. WMI planned to use the results of this study to determine the type of liner needed for C&D waste landfills. The study began in 1991 and initially included four landfills: 1) an Ohio landfill owned by WMI, 2) a Kentucky landfill owned by WMI, 3) a Michigan landfill not owned by WMI, and 4) a Massachusetts landfill not owned by WMI. After the first year of sampling was completed, the investigators discovered that the Ohio landfill used steel mill slag as a granular bed within its leachate collection system. The steel mill slag significantly impacted the analytical results, therefore, the Ohio landfill was removed from the study. The investigators replaced the Ohio site with a Wisconsin landfill not owned by WMI in 1992. Sampling results from the Wisconsin site are only available for 1993.

The leachate samples from the various landfills were analyzed for Priority Pollutants, TCLP parameters, Appendix IX parameters identified in the Resource Conservation and Recovery Act (RCRA) and located in Title 40 of the Code of Federal Regulations, Part 261, and conventional parameters. The document states that the samples were analyzed for parameters identified under Appendix II of 40 CFR Part 261, however, Appendix II of Part 261 simply refers to TCLP test procedures. There is not an Appendix II list of chemicals. It is uncertain what the report was referring to as the Appendix II list. The chemicals included in Appendix IX can exist in wastes and are considered to be health hazards. According to the authors, regulatory agencies often require Appendix IX testing to determine if groundwater contamination is occurring. The Appendix II list given in the report consists of 219 chemicals. A majority of the chemicals included in Appendix II are also included in the Appendix IX list. The Priority Pollutant list was developed as part of the Clean Water Act Industrial Pretreatment Program. The investigators included these parameters in this study because they can cause problems for wastewater treatment

plants that process leachate. The Toxicity Characteristic Leaching Procedure (TCLP) replaced the EP toxicity procedure under Subtitle C of RCRA. The TCLP test is designed to more accurately predict the leaching potential of solid waste and to determine if the leachate is hazardous. The TCLP test is currently used for 39 parameters, however, the EPA is considering expanding the list to a total of 200 parameters. Although RCRA has not been changed, the investigators felt it was prudent to test for all of the parameters included on the expanded list. In total, the samples were analyzed for 253 parameters. This is by far the largest number of parameters that were sampled for in one study. The sampling results are included in Appendix A. Parameters that were detected in at least one sample from any of the landfills are included in Appendix A. If the samples were tested for a particular parameter, but the parameter was not detected in any sample, the parameter was not included in Appendix A.

Because this is an ongoing study, the investigators analyzed the data by comparing the results of the 1993 sampling rounds with the results from the previous two years. The following conclusions were presented in the Waste Management Inc. report. The investigators concluded that none of the leachate from the five C&D waste landfills would be classified as hazardous waste because all of the samples passed the current TCLP test. The number of volatile organic compounds detected increased from 3 compounds in 1992 to 8 compounds in 1993. Likewise. the number of semi-volatile compounds detected increased from 6 in 1992 to 11 in 1993. There was no trend among the pesticides, herbicides, and insecticides. The number of metals detected in 1993 remained approximately the same with arsenic, barium, chromium, lead, nickel, and zinc being detected the most frequently. The compounds detected in 1993 never exceeded the maximum contaminant levels established by the National Primary Drinking Water Standards. However, the amount of iron, zinc, total dissolved solids, and sulfates exceeded the National Drinking Water Secondary Standards at least once in 1993. Because the leachate can contain elevated levels of some contaminants, the investigators concluded that engineering controls, such as liners, leachate collection systems, and groundwater monitoring wells, should be installed at landfills which accept C&D waste.

# 2.4 SKB Rich Valley Demolition Waste Management Facility Study

The SKB Rich Valley Demolition Waste Management Facility is located in Inver Grove Heights, Minnesota. The Minnesota Pollution Control Agency issued a permit for landfill

operations to the facility in August 1989. As part of its closure and post closure plans, the facility was required to assess the potential damage to the environment resulting from facility operations. As a result, SKB Demolition Waste Disposal contracted Nova Environmental Services Inc. to assess the potential for environmental damage. Interpoll Laboratories was contracted to update this original study in 1992 (Interpoll Laboratories 1992).

The facility was constructed with a liner and leachate collection system. The liner was constructed of a two foot compacted clay base overlaid with a three foot protective drainage layer consisting of medium sand. The bottom layer had a maximum permeability of 1 x 10<sup>-7</sup> cm/sec. The top layer had a minimum permeability of 5 x 10<sup>-3</sup> cm/sec. Six inch in diameter PVC collection pipes were installed between the two layers to collect leachate. The leachate flows by gravity to collection pipes and a lift station. Leachate is collected at the lift station and transported off site for treatment at an industrial/domestic wastewater treatment plant.

The landfill has accepted only construction waste and demolition debris since opening in 1989. The waste includes concrete, brick, asphalt, stucco, rock/gravel, metal, roofing, wood and other miscellaneous materials. The facility does not accept yard wastes, liquids, septic tank pumping, vehicles, tires, machinery, appliances, fertilizers or hazardous wastes.

Eight leachate samples were obtained during the period 1990 through 1992. The results of the sampling are included in Appendix A. The first leachate sample was analyzed for both routine and extended parameters. Routine parameters included common heavy metals, other metals, and conventional parameters. Extended parameters included carcinogenic polynuclear aromatic hydrocarbons (PAH's) such as benzo(g)pyrene and noncarcinogenic PAH's such as acenaphthene and pyrene. The remaining seven leachate samples were analyzed for routine parameters only. Table 2.2 contains a list of all parameters included in this study. Appendix A contains the complete results of these eight sampling rounds. The samples were compared to the either the recommended allowable limits (RAL's) for drinking water, maximum contaminant levels (MCL's) under the Safe Drinking Water Act, secondary maximum contaminant levels (SMCL's) under the Safe Drinking Water Act, or intervention limits. RAL's apply to private drinking water standards in Minnesota.

Chloride, total dissolved solids, iron, manganese, nitrate, and nitrite exceeded an SMCL during one or more the sampling events. The investigators believe that the high level of nitrate,

nitrite and dissolved iron contained in the Fall 1990 results are erroneous. They performed one additional sampling event in January 1991 to validate these results. The January 1991 sample indicated levels of nitrate, nitrite and dissolved iron that were much more in line with the other sampling events. Arsenic exceeded the RAL in the summer 1990 sample, but did not exceed the MCL. Methylene chloride, 1,1,1-trichloroethane, and trichlorofluoromethane were identified in the spring 1990 sample, however, they did not exceed the applicable standards. The study reported the carcinogenic and noncarcinogenic PAH's as cumulative totals only. The cumulative totals were compared to the RAL for Minnesota. The reported values for the carcinogenic and noncarcinogenic PAH's exceeded the RAL levels. Since the study did not indicate the values for individual compounds within these categories, it cannot be determined if any MCL was exceeded.

Table 2.2: Parameters Included in Study for SKB Rich Valley Waste Management Facility

| ROUTINE PARA     | METERS    | EXTENDED PARAMETERS     |                       |                     |  |
|------------------|-----------|-------------------------|-----------------------|---------------------|--|
| Alkalinity       | Manganese | CARCINOGENIC PAH'S      | NONCARCINOGENIC PAH'S |                     |  |
| Ammonia Nitrogen | Magnesium | Benzo(a)anthracene      | Acenaphthene          | 2,3-Dihydroindene   |  |
| Arsenic          | Mercury   | Benzo(b)fluoranthene    | Acenaphthylene        | Fluoranthene        |  |
| Cadmium          | Nitrate   | Benzo(k)fluoranthene    | Acridine              | Fluorene            |  |
| Chromium         | Potassium | Benzo(g)pyrene          | Anthracene            | Indene              |  |
| Copper           | Sodium    | Benzo(g,h,i)perylene    | Benzo(b)thiophene     | Indole              |  |
| Dissolved Solids | Sulfate   | Chrysene                | Benzo(e)pyrene        | 1-Methylnaphthalene |  |
| Suspended Solids | Zinc      | Dibenzo(a,h)anthrancene | Benzo(h)fluoranthene  | 2-Methylnaphthalene |  |
| Lead             | Iron      | Indeno(1,2,3-cd)pyrene  | Biphenyl              | Naphthalene         |  |
| COD*             | Barium*   | Quinolene               | 2,3-Benzofuran        | Perylene            |  |
| Calcium*         | Chloride* |                         | Carbazole             | Phenanthrene        |  |
|                  |           |                         | Dibenzothiophene      | Pyrene              |  |

<sup>\*</sup>Sampled only after Spring Quarter 1992.

#### 2.5 Sanifill C&D Waste Landfill Study

This paper presents a composition study of construction and demolition waste and analytical results from leachate collected at three Houston C&D waste landfills (Norstrom et al. 1991). The researchers' primary goal related to leachate was to identify elevated chemical constituents for tracking in a groundwater monitoring program. The researchers chose three C&D waste landfills

owned and operated by Sanifill Inc. of Houston, Texas. The landfills have liners, however the composition of the liners is unknown. The study did not indicate whether or not the landfills had leachate collection systems. The landfills accepted C&D waste composed of wood, brush, grass, concrete, rock, asphalt, metal, rubber, glass, roofing materials, carpet and drywall.

Two leachate wells were installed at each of the landfills. The leachate wells were installed by a drill rig with an 8-inch hollow stem auger. Sampling was accomplished by bailing. Samples were transported to the laboratory within two hours of sampling. Table 2.3 summarizes the salient characteristics of the landfills and leachate wells.

Table 2.3: Leachate Well Schedule

| Well # | Site       | Final<br>Cover<br>El., Ft. | Well<br>Bottom<br>El., Ft. | Top of<br>Liner<br>El., Ft. | Waste<br>Thickness | Approx.<br>Waste<br>Age | Sampled/<br>Dry |
|--------|------------|----------------------------|----------------------------|-----------------------------|--------------------|-------------------------|-----------------|
| A-L1   | Landfill A | 105                        | 50                         | 45                          | 60                 | 9/84                    | Sample          |
| A-L2   | Landfill A | 110                        | 55                         | 52                          | 58                 | 12/88                   | Dry             |
| B-L1   | Landfill B | 120                        | 60                         | 51                          | 69                 | 4/86                    | Sample          |
| B-L2   | Landfill B | 129                        | 50                         | 42                          | 67                 | 1/89                    | Sample          |
| C-L1   | Landfill C | 41                         | 23                         | -10                         | 51                 | 10/87                   | Dry             |
| C-L2   | Landfill C | 39                         | -1                         | -8                          | 49                 | 8/89                    | Dry             |

The study reported a range of values for each constituent. The results of this study are included in Appendix A. The study sampled for conventional parameters, heavy metals and other metals. Table 2.4 summarizes the parameters included in this study. Because the study reported a range of values, only a minimum and maximum concentration for each constituent can be determined.

One or more samples exceeded the MCL for arsenic, barium, cadmium, chromium, lead and mercury. One or more samples exceeded the SMCL for zinc, nitrate, iron, total dissolved solids, manganese, and sodium. Since leachate is often treated by an industrial wastewater treatment plant, the researchers compared the analytical results to the limits for various constituents presented in the wastewater treatment plant ordinance for the City of Houston. The levels of barium, lead, manganese, and zinc in the leachate exceeded these wastewater limits at least once. The researchers concluded that C&D leachate posed a threat to groundwater quality if not

properly contained. Also, pretreatment may be necessary if the leachate is being transported to an industrial wastewater treatment plant.

Table 2.4: Parameters Included in Sanifill C&D Waste Landfill Study

| Specific Conductance | Alkalinity       | Boron       | Potassium |
|----------------------|------------------|-------------|-----------|
| BOD 5 Days           | Chloride         | Phosphorous | Magnesium |
| Organic Nitrogen     | Sodium           | Cadmium     | Barium    |
| Ammonia Nitrogen     | Dissolved Solids | Chromium    | Selenium  |
| Nitrate              | Suspended Solids | Copper      | Silver    |
| Nitrite              | Cyanide          | Nickel      | Mercury   |
| COD                  | Calcium          | Lead        | Iron      |
| Total Organic Carbon | Oil and Grease   | Zinc        | Manganese |
| Hardness             | Phenol           | Arsenic     | Sulfates  |
| pН                   |                  |             |           |

#### 2.6 Connecticut Bulky Waste Leachate Characterization Survey

The purpose of this study was to characterize the leachate from bulky waste landfills. The State of Connecticut used the information to assess the impacts from proposed bulky waste landfill sites (Hamel 1989). The State of Connecticut defines bulky waste as demolition debris and landclearing debris. The investigators initiated a six month study of five different landfills in 1988. Between two and four sampling events occurred during the sixth month study. Appendix A contains the results from this study.

The following five landfills were included in this report: 1) Deep River Bulky Waste Landfill, 2) Guilford Bulky Waste Landfill, 3) Glastonbury Bulky Waste Landfill, 4) Former ITI Trucking Terminal at South Windsor, and 5) Groton Bulky Waste Landfill. The study did not include a detailed description of these sites. It is unknown whether the sites have liners and leachate collection systems. The sites accept only demolition debris and landclearing debris. The samples were taken mostly from seeps at the base of the landfills. The investigators sampled for conventional parameters and heavy metals. Table 2.5 summarizes the parameters that were sampled.

There were a total of 15 samples from the five landfills. One sample exceeded the MCL for cyanide. Two samples were outside the range required for pH. Thirteen samples exceeded the

SMCL for iron. Ten samples exceeded the SMCL for total dissolved solids. All samples exceeded the SMCL for manganese. Eight samples exceeded the MCL for cadmium and thirteen samples exceeded the MCL for lead. The investigators felt that these results should be used with caution. Because the sites are relatively young and small with waste piled thinly over the site, the leachate strength could be lower than that of leachate generated at older and larger facilities. Also, the trend toward processing and recycling C&D waste could change the composition of leachate from C&D waste sites in the future. The investigators believe that reducing the decomposable portion of the waste stream should reduce the oxygen demand and nitrogen loading on surface waters. This would proportionally increase the presence of painted and processed building materials and metals from demolition waste, which could increase metal loading in the leachate.

Table 2.5: Parameters Included in State of Connecticut Leachate Study

| Specific Conductance | pН               | Cadmium  | Barium    |
|----------------------|------------------|----------|-----------|
| BOD 5 Days           | Alkalinity       | Chromium | Selenium  |
| Organic Nitrogen     | Chloride         | Copper   | Silver    |
| Ammonia Nitrogen     | Sodium           | Nickel   | Mercury   |
| Nitrate              | Dissolved Solids | Lead     | Iron      |
| Nitrite              | Suspended Solids | Zinc     | Manganese |
| COD                  | Cyanide          | Arsenic  | Sulfates  |
| Hardness             |                  |          |           |

#### 2.7 U.S. Environmental Protection Agency Summary

At the time of publication of this report, the U.S. EPA was in the process of developing a rule addressing non-municipal facilities that may receive hazardous wastes from conditionally exempt small quantity generators (CESQGs). The rule has since been promulgated as a draft by the EPA. One of the largest categories of non-municipal facilities that could accept hazardous waste from CESQGs is C&D landfills. This report was prepared in support of the EPA's rulemaking (EPA 1995).

The information used to prepare the EPA report came from literature by the National Association of Demolition Contractors (NADC) and a small number of readily available reports. The landfills included in the EPA report are identical to the landfills included in this study with

two exceptions. The EPA included the D&M site and Armetta property in Connecticut. The EPA report indicates that the data for these sites were included in the NADC leachate quality data report published in 1994. However, the copy of the NADC leachate quality data report used by this investigator did not include the D&M site or the Armetta property. The data from these sites were taken directly from the EPA report and is included in this report and are summarized in Appendix A. Because the EPA report did not include a summary of the landfill characteristics, no information is known about these two sites.

The EPA report used parameter-specific regulatory and health-based benchmarks as a basis for screening potential risks. The Safe Drinking Water Act National Primary and Secondary Drinking Water Standards were used for comparison when available. When the primary and secondary standards were not available, the EPA report used health-based benchmarks for a leachate ingestion scenario. Reference-doses were used for non-carcinogenic parameters and risk-specific doses were used for known carcinogens. No benchmark was established if sufficient studies had not been conducted on a parameter. The EPA report screened out parameters that never exceeded the benchmarks. A median concentration was calculated for each parameter that exceeded the benchmark at least once. The median value was calculated by first taking the median value of each landfill, than computing the median value for all landfills. Because of this methodology, each landfill was represented only once and each landfill was weighted exactly the same. The median value calculated in this manner was compared to the applicable benchmark.

Based on the number of landfills at which the benchmark was exceeded, and a comparison between the median and the benchmark, the EPA report felt that seven parameters were "potentially problematic." The following list shows the seven parameters of concern:

| <u>Organics</u>    | <b>Inorganics</b> | Conventional Parameters |
|--------------------|-------------------|-------------------------|
| 1,2-dichloroethane | cadmium           | manganese               |
| methylene chloride | lead              | iron                    |
|                    |                   |                         |

total dissolved solids

For iron, manganese, and total dissolved solids, the benchmarks are secondary MCL's that are set to protect water supplies for aesthetic reasons (e.g., taste) rather than for health-based reasons. None of the remaining four parameters exceed the health-based benchmarks by a factor of ten or more. This fact is significant. The investigators at the EPA believed that leachate would be

diluted by a factor of ten by the time it reached any groundwater monitoring wells or drinking water wells downgradient of a C&D waste landfill. If the leachate was not at least ten times greater than the applicable groundwater standard, the groundwater resulting from the leachate would not exceed the applicable standards. Thus, the EPA did not believe that any of the seven parameters listed above would pose a problem at C&D waste landfills.

#### 2.8 Conclusions

The data from each of these reports will be used to assess which chemical constituents found in C&D leachate could pose health and environmental problems. Appendix A contains two tables for each landfill identified in the literature sources discussed in the preceding section. The first table summarizes the landfill characteristics as reported in the literature source. The second table summarizes the analytical data gathered for the landfill. The parameters included in this table were detected at least once out of all of the data collected from the various literature sources. Eighty-two parameters were detected at least once. Table 2.6 on the following page summarizes the parameters that were analyzed for, but never detected in any sample. There were 197 parameters that were never detected in any sample.

The literature reviewed in the preceding sections indicate that parameters included in Table 2.7 have been detected at levels which could pose a threat to human health and the environment. The analysis performed in the next section will identify the chemical parameters that seem to consistently pose a threat to health and the environment.

 Table 2.6 Parameters That Were Never Detected in Leachate Samples

| ORGANICS                    | Chlorobenzene               | trans-1,3-Dichloropropene      | Hexachloropropene           | Pentachloroethane              |
|-----------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|
| Acetonitrile                | Chlorobenzilate             | 1,1-Dichloropropene            | Indeno(1,2,3-cd)pyrene      | Phenacetin                     |
| Acetophenone                | 2-Chloro-1,3-butadiene      | 2,3-Dichloro-1-propene         | Iodomethane                 | Phenanthrene                   |
| 2-Acetylaminofluorene       | Chlorodibromomethane        | cis-1,3-Dichloropropene        | Isobutanol                  | Phenolphthalein Alkalinity     |
| Acrolein                    | 2-Chloroethyl Vinyl Ether   | p-(Dimethylamino)azobenzene    | Isodrin                     | p-Phenylemediamine             |
| Acrylonitrile               | 4-Chloro-3-methylphenol     | Dimethaote                     | Isophorone                  | Phorate                        |
| Aldrin                      | 4-Chlorophenyl phenyl ether | 7/12-Dimethylbenz(a)anthracene | 2-Isophorone                | 2-Picoline                     |
| alpha-Chlordane             | 2-Chloronaphthalene         | 3,3-Dimethylbenzidine          | Isosafrole                  | Pronamide                      |
| alpha-Endosulfan            | 2-Chlorphenol               | Dimethylphenethylamine         | Kepone                      | Propionitrile                  |
| 4-Aminobiphenyl             | 3-Chloropropene             | 2,4-Dimethylphenol             | Lindane                     | Pyrene                         |
| Aniline                     | Chrysene                    | Dimethyl phthalate             | Methacryonitrile            | Pyridine                       |
| Anthracene                  | Cumene                      | 1,3-Dinitrobenzene             | Methapyrilene               | Safrole                        |
| Aramite                     | 2,4-D                       | 4,6-Dinitro-2-methylphenol     | Methoxychlor                | Silvex; 2,4,5-TP               |
| Aroclor/PCB 1016            | 4,4-DDD                     | 2,4-Dinitrophenol              | 3-Methychloranthrene        | Sulfotepp                      |
| Aroclor/PCB 1221            | 4,4,4-DDT                   | 2,4-Dinitrotoluene             | Methyl methacrylate         | TCDD                           |
| Aroclor/PCB 1232            | delta-BHC                   | 2,6-Dinitrotoluene             | (3&4)-Methylphenol          | 2,3,7,8-TCDD                   |
| Aroclor/PCB 1242            | Diallate                    | Dinoseb, DNBP                  | 1,4-Naphthpquinone          | TCDF                           |
| Aroclor/PCB 1248            | Dibenzo(a,h)anthracene      | Di-a-octyl phthalate           | 1-Naphthylamine             | 1,2,4,5-Tetrachlorobenzene     |
| Aroclor/PCB 1254            | Dibenzofuran                | Di-n-octyl phthalate           | 2-Naphthylamine             | 1,1,1,2-Tetrachlorethane       |
| Aroclor/PCB 1260            | Dibromochloromethane        | 1,4-Dimene                     | 3-Nitroaniline              | 1,1,2,2-Tetrachlorethane       |
| Benzo-a-anthracene          | 1,2-Dibromo-d-chloropropane | Diphenylamine                  | 4-Nitroaniline              | 2,3,4,6-Tetrachlorophenol      |
| Benzo-a-pyrene              | Dibromomethane              | Endosulfan sulfate             | Nitrobenzene                | Tetrahydrofuran                |
| Benzo-b-fluoranthene        | 1,2-Dibromoethane           | Endosulfan I                   | o-Nitrophenol               | Thionazin                      |
| Benzo(k)fluoranthene        | Di-a-butyl phthalate        | Endosulfan II                  | p-Nitrophenol               | o-Toluidine                    |
| Benzo-g,h-perylene          | Dichloroacetonitrile        | Endrin aldehyde                | 4-Nitroquininoline-1-oxide  | Toxaphene                      |
| Benzyl alcohol              | 1,2-Dichlorobenzene         | Endrin ketone                  | N-Nitrosodi-a-butylamine    | 1,2,4-Trichlorobenzene         |
| beta-BHC                    | 1,3-Dichlorobenzene         | Ethyl ether                    | N-Nitrosodiethylamine       | 1,1,1-Trichloroethane          |
| beta-Endosulfan             | 1,4-Dichlorobenzene         | Ethylmethacrylate              | N-Nitrosodimethylamine      | 1,1,2-Trichloroethane          |
| Bis(2-cholorethoxy)methane  | 3-3-Dichlorobenzidine       | Ethyl methane sulfonate        | N-Nitrosodimethylethylamine | 2,4,5-Trichlorophenol          |
| Bis(2-chloroethyl)ether     | trans-1,4-Dichloro-2-butene | Ethyl parathion                | N-Nitrosodiphenylamine      | 2,4,6-Trichlorophenol          |
| Bis(2-chloro-1-methyl)ether | Dichlorodifluoromethane     | Famphur                        | N-Nitrodo-di-n-propylamine  | 1,2,3-Trichloropropane         |
| Bromodichloromethane        | 1,2-Dichloroethene          | Fluoranthene                   | N-Nitrosomorpholine         | 1,1,2-Trichlorotrifluorethane  |
| Bromoform                   | 1,1-Dichlooethene           | Fluorene                       | N-Nitrosopiperidine         | o,o,o-Triethyl phosphorothiole |
| Bromomethane                | Dichlorofluoromethane       | Heptachlor                     | N-Nitrosopyrolidine         | sym-Trinitrobenzene            |
| 4-Bromophenyl-phenylether   | 2,4-Dichlorphenol           | Heptachlor epoxide             | 5-Nitro-o-toluidine         | Vinyl acetate                  |
| Butyl benzyl phthalate      | 2,6-Dichlorphenol           | Hexachlorobenzene              | PeCDD                       | Vinyl chloride                 |
| Carbon tetrachloride        | trans-1,3-Dichloropropane   | Hexachlorobutadiene            | PeCDF                       |                                |
| Carbonate                   | 1,2-Dichloropropane         | Hexachlorocyclopentadiene      | Pentachlorobenzene          | INORGANICS                     |
| Chlorodane                  | 1,3-Dichloropropane         | Hexachloroethane               | Pentachloronitrobenzene     | Thallium                       |
| 4-Chloroaniline             | 2,2-Dichloropropane         | Hexachlorophene                | Pentachlorophenol           | Tin                            |

Table 2.7: Parameters Identified as Problematic in the Literature

| ORGANICS           | HEAVY METALS |         | CONVENTIONAL PARAMETERS |                        |
|--------------------|--------------|---------|-------------------------|------------------------|
| 1,2-Dichloroethane | Arsenic      | Lead    | Boron                   | Nitrite                |
| Methylene Chloride | Barium       | Mercury | Chloride                | pН                     |
|                    | Cadmium      | Zinc    | Cyanide                 | Sodium                 |
|                    | Chromium     |         | Iron                    | Sulfate                |
|                    |              |         | Manganese               | Total Dissolved Solids |
|                    |              |         | Nitrate                 |                        |

# 3.0 Methodology for Statistical Analysis

#### 3.1 Introduction

The literature sources that have been reviewed employed a variety of methods to analyze leachate data. The most frequent method used by the investigators was a simple comparison between the leachate data and a regulatory limit (primary maximum contaminant levels (MCL's), secondary MCL's, or other guidance concentrations). The authors of the Waste Management report compared the leachate data gathered in 1993 to data gathered in 1991 and 1992. The authors looked for trends to determine if the leachate would be classified as a hazardous waste, and compared the data to the applicable groundwater standards. The EPA report of 1995 was the only study that attempted to statistically analyze leachate data. Investigators at the EPA determined a median value for each parameter at each landfill. These median values were then analyzed and compared to the applicable groundwater standard. The investigators at the EPA chose to use the median value of the combined data as the statistic to compare with the groundwater standards. The EPA did not use the non-detects in their calculations of the median values. They treated the non-detects as if they were never reported. If a sample was analyzed for a parameter, but the laboratory was not able to detect the parameter, the value given to the parameter is known as a non-detect. The laboratory reports the results as "<x", where x is the method detection limit.

The EPA conducted only a cursory statistical analysis on the leachate data (EPA 1995). The leachate data gathered for this report will be analyzed using statistical procedures described in "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities" (EPA 1989, 1992). This publication is intended to assist in the evaluation of groundwater monitoring data. Although the data under study are from leachate, not groundwater wells, the statistical procedures given in the publication will handle all types of water samples. The advantage to using these statistical procedures is that they can handle non-detected data. Thus, the results of these statistical tests will be more appropriate because the non-detects were included in the study.

#### 3.2 Methodology

The methods used to analyze the data are similar to the methods used in the other reports and studies reviewed in chapter two. The basic approach included several steps. The first step was to determine the mean of all the parameters for each landfill. All of data were then combined

and values determined for the mean and maximum concentrations for each parameter over all of the landfills. Other statistics such as the number of times the parameter was detected at different landfills were also determined. The results of these steps are included in tabular form, and for certain parameters, graphical form. The last step involved conducting a statistical test of the data to determine if parameters could pose a risk to human health and the environment. This was accomplished by comparing leachate data for a particular contaminant to a regulatory standard for groundwater. It is recognized that leachate from a landfill is more concentrated than leachate-contaminated groundwater, but this method provides an assessment of the level of concern which should be awarded a particular contaminant. The following sections will address in detail the methods used to analyze the data.

The number of samples that were reported for each landfill varied from 1 to 20. The raw data could not be analyzed by treating all of the data as one large data set because the landfills with more samples would disproportionately influence the results. In order to avoid this situation, all of the samples at a particular landfill were averaged. The averages were then used to represent each landfill. This procedure ensured that each landfill was equally represented. The averaged data at each landfill were used to conduct the statistical analysis.

The mean was chosen instead of the median because the mean gives a larger numeric value. In order to determine if a parameter is statistically the same as or greater than the applicable regulatory standard, a value representing the parameter is compared to the standard. The larger the value is, the higher the probability is that the parameter will exceed the standard. This investigator wants to report the worst possible scenario, therefore each parameter will be represented by the largest possible value. For the data being analyzed, there tends to be large outlying values. These data points will increase the value of the mean. The median is not influenced by outlying values, therefore the median value would tend to be lower than the mean.

The data are separated into five categories: 1) volatile organics, 2) semi-volatile organics, 3) other organics, 4) heavy metals, and 5) conventional parameters. Most landfills analyzed for conventional parameters and heavy metals. Less than 10 landfills analyzed their samples for volatiles, semi-volatiles, and other organics such as pesticides and herbicides. To compound the problem, few landfills actually detected these three groups of chemicals in the leachate. It is difficult to conduct a full statistical analysis on these three groups because of the infrequency of

sampling and the large percentage of non-detects. For these three categories, the data were analyzed using a simple statistical procedure. For each parameter, the mean was calculated from the average values for the landfills. Along with the mean, the maximum concentration and the maximum mean value for a landfill was reported for each parameter. The data in these three groups were not analyzed further.

The two remaining groups of data are heavy metals and conventional parameters. There were sufficient data in both these groups to perform a complete statistical analysis. There are four methods to handle the data depending on the number of sites that sampled for a parameter, the number of non-detects for a parameter, and the distribution of the data. The methods include Cohen's Method, Aitchinson's Method, the standard student t-test, and a nonparametric test. All methods were taken from "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities" (EPA 1989). The test procedures are briefly summarized in the following sections.

For each landfill, the mean of each parameter was computed. This mean became the reported value of the parameter for each landfill. The non-detects were converted to one-half the method detection limit. If the method detection limit was not given for a sampling round, the method detection limit given by "Test Methods for Evaluating Solid Waste Physical/Chemical Methods" (EPA 1986) or "Methods for Chemical Analysis of Water and Wastes" (EPA 1979), was used in its place. In some cases, the actual test method was also unknown. For these instances, the sampling data from another landfill that analyzed for the same parameter were reviewed. The test method used for the parameter in the majority of the sampling data was substituted for the unknown test method. Appendix B contains a summary of the test methods and method detection limits used in the analysis. The mean values at each landfill were analyzed by all of the following statistical methods.

#### 3.3 Standard Student T-Test

When comparing sampling data to a constant compliance limit, the appropriate statistical method is to determine a confidence interval, tolerance interval, or prediction interval, and compare the compliance limit to the interval. Intervals normally take the following form:

 $\mu \pm z * \sigma / n$ , where  $\mu =$  average,  $\sigma =$  s tandard deviation, n = sample size, z = varies

The variable z varies depending on the method used and the characteristics of the data set. The intervals will vary in width depending on the z that is used. The main difference between the three intervals is the z that is used to construct the intervals. Confidence intervals are used when comparing compliance limits that are not health based. They can be less stringent, therefore the z is usually around 2.0 for a 95% confidence interval. Confidence intervals are widely used in statistical analysis (Ott 1992). The tolerance intervals and prediction intervals are specified for groundwater monitoring situations where the compliance officer wants to ensure that the limit is exceeded only a small fraction of the time. Because of this, these intervals are very stringent. The z's used for the tolerance intervals are much higher than two, therefore the intervals are much wider than the confidence intervals. The tolerance and prediction intervals would not be appropriate for analyzing leachate data. As previously discussed, leachate is highly concentrated and is not representative of the groundwater in the area of the landfill. Applying stringent requirements to leachate would result in most of the parameters being identified as problems. Confidence intervals are less stringent than tolerance or prediction intervals, yet they will still identify when the mean of the leachate is approximately equal to or larger than the appropriate groundwater limit.

The confidence intervals are constructed so that there is a 99% chance that the actual mean for the data is contained in the interval. The mean and standard deviation for each parameter are calculated. The confidence interval is constructed by the following equation:

$$\overline{x} \pm t_{(0.99,n-1)} / \sqrt{n}$$
, where  $\overline{x} = mean$ ,  $S = standard deviation$ , and  $n = sample size$ 

The EPA publication recommends the following approach (EPA 1989, 1992). The approach is illustrated in Figures 3.1 and 3.2. Figure 3.1 shows a MCL of 100 units which is contained within the confidence interval that extends from 5 to 150 units. Figure 3.2 shows a MCL of 0.5 units which is below the same confidence interval. The EPA manual would say that the situation represented in Figure 3.1 is in compliance because not all of the data are above the MCL of 100 units (EPA 1989, 1992). Figure 3.2 is out of compliance because all of the data are above the MCL of 0.5 units. In summary, 99% of the data must be above the MCL before the EPA approach would consider the parameter out of compliance. This investigator feels the EPA approach is not appropriate for this study. Since the confidence interval is constructed to contain

Figure 3.1: Example 1 of Confidence Intervals

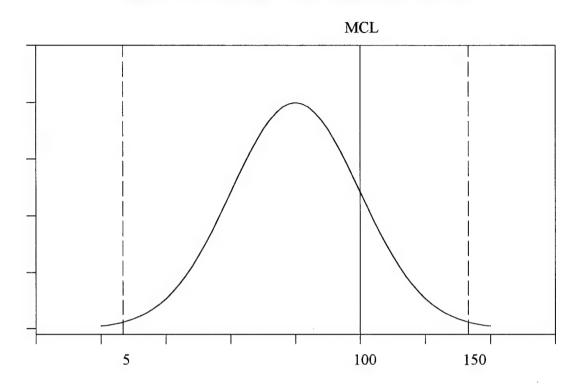
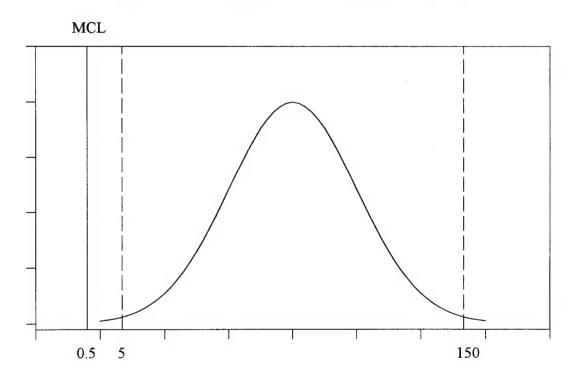


Figure 3.2: Example 2 of Confidence Intervals



99% of the values that could be the actual population mean, if the MCL is within the interval, there is a possibility that the MCL is the population mean. Using this rationale, Figure 3.1 would be out of compliance because there is a possibility that the mean of the data equals 100 units. This investigator feels that if a MCL is within the confidence interval, it should be declared a problem. The only way a set of data would be in compliance is if the MCL was higher than the entire confidence interval. Any other result will be deemed out of compliance and therefore could present a risk to the public health and environment. This investigator feels this combination approach is sufficiently conservative to identify problems, without being so conservative that everything is a problem.

The student t-test can only be used when the sample contains less than 15% non-detects (EPA 1989). The non-detects are set at one-half of the method detection limit, and the mean and standard deviation are calculated including the non-detects. As stated previously, some of the samples did not include method detection limits. In those cases, the appropriate method detection level was determined based on "Test Methods for Evaluating Solid Waste Physical/Chemical Methods" (EPA 1986), or "Methods for Chemical Analysis of Water and Wastes" (EPA 1979). Appendix B contains a summary of the test methods and the method detection limits used in this report. If more than 15% of the sample contained not detects, one of the following methods was used to determine the confidence intervals.

#### 3.4 Cohen's Method

Cohen's method provides estimates of the sample mean and standard deviation when the percent of not-detects is between 15% and 50% (EPA 1989, 1992). The underlying assumption of this method is that all of the data (detects and non-detects) come from the same normal or lognormal population, but that the non-detects have been censored at the detection limit. This means that the parameter is present in the sample, but cannot be "seen." In order to test this assumption, a probability plot of the data should be constructed. To construct a probability plot, all of the data are ranked from smallest to largest, including the non-detects. The cumulative probability and normal quantiles are constructed from the ranked data. The cumulative probability is equal to the i/(n+1) where i is the rank and n is the sample size. The normal quantiles are simple the z statistic that corresponds to the cumulative probability. The actual concentrations are plotted against the normal quantiles. If the sample is normally distributed, the data should plot as a

straight line (approximately). The non-detects are not plotted. Some samples follow a log-normal distribution, or the log of the concentration plotted against the normal quantile is a line. In order to determine whether this method was appropriate, the parameters with percentages of non-detects between 15% and 50% where analyzed in this manner. Probability plots of the data and the log of the data were constructed to determine if it was appropriate to use this method. These plots are included in Appendix C.

Once it was determined that this method was appropriate for a parameter, the following equations were used to calculate a cohen parameter, lambda:

$$h = \frac{(n-m)}{n}$$
,  $\gamma = \frac{S_d^2}{(x_d - DL)^2}$ , where  $S_d^2$  = variance of detected values,

 $\overline{x_d}$  = mean of detected values, n = total sample size, m = total number of detected values

The first equation calculates the fraction of non-detects, or h. The second equation calculates a parameter  $\gamma$ , which is used to determine lambda. DL is the method detection limit for the parameter. Once is  $\gamma$  determined, the following equation is used to determine the adjusted mean and sample standard deviation:

$$\overline{x} = \overline{x}_d - \hat{\lambda}(\overline{x}_d - DL)$$
 and  $S = (S_d^2 + \hat{\lambda}(\overline{x}_d - DL)^2)^{\frac{1}{2}}$ , where  $\overline{x} =$  adjusted mean,  $\widetilde{\lambda} =$  Cohen's parameter based on  $\lambda$  and  $h$ , and  $S =$  adjusted standard deviation

All other variables in the above equation have the same meaning as previously described. These adjusted mean and standard deviations are used in the above student t-test to determine the confidence intervals.

# 3.5 Atichinson Method

The Atichinson Method may also used when a sample contains between 15% and 50% of non-detects (EPA 1989, 1992). The difference between the two methods lies in the assumptions. This method assumes that the detected values come from a normal or log-normal distribution, but that the non-detects are equal to zero. In order to test the assumption, a probability plot is constructed from the data, but the non-detects are not included in the ranking. If the plot of concentration versus normal quantile is linear, than the assumption is valid. This method was used for only one parameter, and the probability plot for the parameter is included in Appendix B.

The adjusted mean and standard deviation are computed based on the following equations:

$$\hat{\mu} = (1 - \frac{d}{n})x^* \text{ and } \hat{\sigma}^2 = \frac{n - (d+1)}{n-1}(s^*)^2 + \frac{d(n-d)}{n(n-1)}(x^*)^2, \text{ where } s^* = \text{std dev of detected values,}$$

$$x^* = \text{mean of detected values, } n = \text{total sample size, and } d = \text{no. of non-detects.}$$

The adjusted mean and standard deviation are used in a standard student t-test to compute the confidence interval for the parameter.

# 3.6 Nonparametric Method

A nonparametric approach is necessary if there are more than 50% but less than 90% non-detects (EPA 1989). The nonparametric approach is used because when there are so many non-detected values, the data do not follow a normal distribution. This method requires a minimum of 7 data points. The confidence interval constructed with this method gives a two-sided, 98% confidence interval, corresponding to a one-sided confidence coefficient of 99%. The data are ordered from least to greatest with the lowest rank assigned a value of 1. The critical values of the ordered data are determined by the M value that is calculated as follows:

$$M = \frac{n}{2} + 1 + z_{0.99} \sqrt{\frac{n}{4}}$$
, where  $n = sample \ size$ 

The z statistic is approximately equal to 2.33. Once M is calculated, the quantity (n+1-M) is calculated. The confidence interval is equal to the data points of rank (n+1-M) and M. If the compliance limit is within the interval or is smaller than the interval, than the parameter is a potential problem.

#### 4.0 Analysis

#### 4.1 Introduction

Each of the five groups of chemicals will be analyzed separately. A statistical test was not conducted on the volatile organics, semi-volatile organics and other organic compounds. The analysis will be limited to a direct comparison of other the minimum, maximum, and mean of the samples to the applicable groundwater standard. Statistical tests were conducted on the heavy metals and conventional parameters, therefore the results of these tests will be analyzed along with box plots for certain key parameters. The analysis will also attempt to identify possible contaminant sources for the parameters.

In the following analysis, parameters will be deemed to be "problems" when the mean concentration of the parameter in the <u>leachate</u> exceeds the applicable groundwater standard. The parameter is a "problem" in leachate because it could be present in <u>groundwater</u> at concentrations that exceed the applicable standards. If the parameter was present at concentrations that exceed the standards, the landfill would be out of compliance. Stronger terminology cannot be used because there is no information on groundwater quality at these landfills. Leachate at these landfills will become diluted with groundwater before it reaches any groundwater monitoring wells. The amount of dilution will vary, therefore no inferences can be made between concentrations in leachate and concentrations in groundwater. The only conclusion that can be made is that if the concentration of a parameter in <u>leachate</u> does not exceed the applicable groundwater standards, the parameter should not be present in <u>groundwater</u> at levels that exceed the standard. Any other scenario could present a problem for the landfill.

# 4.2 Volatile Organic Compounds

Seventeen volatile organic compounds were detected in the leachate samples. Table 4.1 on the following page summarizes the findings for these parameters. The following nine chemicals never exceeded either the primary maximum contaminant level (MCL), secondary maximum contaminant level (SMCL), or the guidance concentration recommended by the State of Florida (Florida Department of Environmental Protection 1994):

2-Butanone Carbon Disulfide 1,1-Dichloroethane Xylenes

Methyl Ethyl Ketone Ethyl Benzene 1,1,1-Trichloroethane Toluene

Trichlorofluoromethane

Table 4.1: Summary Statistics for Volatile Organics.

| Parameter             | Sites that | Sites that F |          | Max.    | ercent Max. Max. Mean <sup>3</sup> Prin | Mean <sup>3</sup> | Primary | Secondary | Guidance | No. Of     |
|-----------------------|------------|--------------|----------|---------|---|-------------------|---------|-----------|----------|------------|
|                       | Sampled    | Detected     | Detected | Conc.   | Jo                                      |                   | MCL     | MCL       | Conc.    | Means      |
|                       | Parameter  | Parameter    |          | Overall | Means <sup>2</sup>                      |                   |         |           |          | Over       |
|                       |            |              |          |         |   |                   |         |           |          | $Limits^4$ |
| Acetone               | 7          | 4            | 27%      | 100     | 2570.5                                  | 818               |         |           | 700      | 1          |
| Benzene               | 6          | 3            | 33%      | 2.7     | 2.7                                     | 1.5               |         |           | 1        | 1          |
| 2-Butanone            | 9          | 2            | 20%      | 2500    | 2500                                    | 1277              |         |           | 4200     | 0          |
| Carbon Disulfide      | 9          | 3            | 20%      | 15      | 15                                      | 10.9              |         |           | 700      | 0          |
| Chloromethane         | 6          | 2            | 22%      | 43      | 43                                      | 33.5              |         |           | 3        | 2          |
| 1,1-Dichloroethane    | 6          | 5            | %95      | 48      | 48                                      | 13.94             |         |           | 700      | 0          |
| 1,2-Dichloroethane    | 6          | 3            | 33%      | 26      | 26                                      | 18.07             | 3       |           |          | 3          |
| 1,4-Dioxane           | 5          | 1            | 20%      | 46      | 49                                      | 49                |         |           | 5        | 1          |
| Ethyl Benzene         | 6          | 5            | 26%      | 18      | 9.5                                     | 3.41              |         | 700       |          | 0          |
| Methyl Ethyl Ketone   | 9          | 2            | 33%      | 2500    | 1445                                    | 957.5             |         |           | 4200     | 0          |
| 4-Methyl-2-Pentanone  | 8          | 2            | 25%      | 250     | 250                                     | 129.45            |         |           |          | NA         |
| Methylene Chloride    | 6          | 4            | 44%      | 09      | 09                                      | 26.4              | 5       |           |          | 4          |
| Toluene               | 6          | 7            | 78%      | 290     | 265                                     | 60.91             | 1000    |           |          | 0          |
| 1,1,1-Trichloroethane | 9          | 1            | 17%      | -       | 1                                       | -                 | 200     |           |          | 0          |
| Trichloroethylene     | 6          | 4            | 44%      | 20      | 20                                      | 7.34              | 3       |           |          | 3          |
| Trichlorofluormethane | 9          | 2            | 33%      | 20      | 20                                      | 16.5              |         |           | 2100     | 0          |
| Xylenes               | 6          | 9            | %19      | 120     | 2.69                                    | 20.25             | 10000   |           |          | 0          |
|                       |            |              |          |         |   |                   |         |           |          |            |

1) This is the maximum concentration that was every detected of all samples.
2) This is the maximum average concentration of the landfills.

3) Mean does not include non-detects.4) This is the number of times that the average landfill concentrations exceeded the applicable groundwater standards.

These contaminants should not pose a threat to human health or the environment because they never exceeded the applicable groundwater standards, therefore they will not be considered further. Seven contaminants exceeded the groundwater standards at least once and have means that also exceeded the groundwater standards:

Acetone

Benzene

Chloromethane

1.2-Dichloroethane

1,4-Dioxane

Methylene Chloride

Trichloroethylene

The problem with declaring all of these contaminants a potential health problem is that some of these contaminants were only detected at two or three sites. Also, the mean reported in Table 4.1 is a conservative estimate of the actual mean because the non-detects were excluded. The data cannot be analyzed with any degree of confidence because the sample sizes are small and the number of detected values is also small. Of these compounds, only acetone was detected over fifty percent of the time. The mean concentration for acetone was 818 ug/l, which is only slightly higher than the guidance concentration of 700 ug/l. Because the mean is only slightly higher than the groundwater limit, and there were three non-detected values out of seven total sites, it is difficult to say that acetone will be a problem at C&D landfills. C&D landfills should conduct preliminary groundwater tests for acetone to determine if their particular site has a problem with this constituent.

Although methylene chloride and 1,2-dichloroethane were only detected 33% and 44% of the time respectively, the mean concentrations for these contaminants greatly exceed the primary MCL's. The mean concentration of methylene chloride is 26.4 ug/l, which is approximately five times higher than the MCL of 5 ug/l. Likewise, the mean concentration of 1,2-dichloroethane is 18.07 ug/l, which is approximately six times higher than the MCL of 3 ug/l. These contaminants could be present in groundwater at levels that exceed the groundwater standards. Therefore, they could pose a potential risk to health and the environment simply because when they are detected, they are detected at levels that greatly exceed their groundwater standards. Although more research is needed to estimate a true mean concentration for these contaminants, they should be regarded as problems and should C&D landfills should test for these constituents.

The literature indicates several sources of contamination from volatile organic compounds. Petroleum constituents such as benzene can leach from roofing tar and asphalt (EPA 1995). Containers of excess solvents and oils that include many volatile compounds such as

1,2-Dichloroethane are routinely disposed of at C&D landfills. Acetone is a commonly used solvent and cleaner and is found in PVC glue. Acetone could find its way into C&D waste landfills in semi-empty containers.

There are some apparent trends in the data for volatile organic. Of the ten landfills that sampled for these parameters, one landfill accounted for the majority of the highest concentrations. The Massachusetts site detected thirteen compounds and all thirteen were the highest concentrations for the compounds. The Michigan site detected nine compounds, but had none of the highest concentrations. The other landfills had a smaller number of detected compounds and a lower number of the highest concentrations.

In conclusion, more data should be gathered on the presence of volatile organic compounds in leachate. The two contaminants that seem to pose a threat to human health and the environment are methylene chloride and 1,2-dichloroethane because when they are present, they greatly exceed the applicable groundwater standards. Acetone should be included in preliminary testing at C&D landfills because it is present frequently and at concentrations that are roughly equivalent to the groundwater standards.

# 4.3 Semi-Volatile Organic Compounds

Fourteen semi-volatile organic compounds were detected in the leachate samples. Table 4.2 on the following page summarizes the findings for these parameters. The following eight chemicals never exceeded the guidance concentration recommended by the State of Florida (Florida Department of Environmental Protection 1994):

Acenaphthene Acetophenone 2,4-Dimethylphenol Di-n-Butyl Phthalate

Diethyl Phthalate Fluoranthene o-Creosol Pyrene

Because the maximum concentrations for these chemicals do not exceed the recommended guidance concentrations, these chemicals should not pose a threat to health and the environment.

The following five chemicals exceeds the recommended guidance concentration at least once:

Benzoic Acid Napthalene m&p-Creosol Phenathrene Phenol

Of these chemicals, the mean concentration for napthalene, m&p-creosol, phenathrene, and phenol exceeded the recommended guidance concentrations. The mean concentrations were calculated without the non-detects, therefore, these means are a conservative estimate of the true

Table 4.2: Summary of Statistics for Semi-Volatile Organics.

|                             |            | 1 able 4.2: | Summary  | or Statisti          | able 4.2. Summary of Statistics for Semi-Volatile Organics | 1- v oranie       | Organics |           |          |                     |
|-----------------------------|------------|-------------|----------|----------------------|--|-------------------|----------|-----------|----------|---------------------|
| Parameter                   | Sites that | Sites that  | Percent  | Max.                 | Max.   | Mean <sup>3</sup> | Primary  | Secondary | Guidance | No. Of              |
|                             | Sampled    | Detected    | Detected | Conc.                | Jo   |                   | MCL      | MCL       | Conc.    | Means               |
|                             | Parameter  | Parameter   |          | Overall <sup>1</sup> | Means <sup>2</sup>   |                   |          |           |          | Over                |
|                             |            |             |          |                      |  |                   |          |           |          | Limits <sup>4</sup> |
| Acenaphthene                | 5          | 1           | 70%      | 4                    | 3.5  | 3.5               |          |           | 20       | 0                   |
| Acetophenone                | 4          | 1           | 70%      | 2                    | 0  | 0                 |          |           | 700      | 0                   |
| Benzoic Acid                | 6          | 4           | 44%      | 53000                | 53000  | 15457             |          |           | 28000    | 1                   |
| Bis-(2-Ethylhexyl)phthalate | 8          | 2           | 25%      | 31                   | 31   | 16.5              |          |           |          | NA                  |
| 2,4-Dimethylphenol          | 8          | 1           | 13%      | 15                   | 15   | 15                |          |           | 400      | 0                   |
| Di-n-Butyl phthalate        | 8          | 2           | 72%      | 11                   | 11   | 6                 |          |           | 700      | 0                   |
| Diethyl Phthalate           | 8          | 3           | 38%      | 91                   | 16   | 8                 |          |           | 2600     | 0                   |
| Fluoranthene                | 8          | 1           | 13%      | 180                  | 180  | 180               |          |           | 280      | 0                   |
| Napthalene                  | 8          | 3           | 38%      | 130                  | 130  | 98                |          |           | 7        | 3                   |
| m&p-Creosol                 | 8          | 3           | 38%      | 5700                 | 4450   | 1822              |          |           | 35       | 3                   |
| o-Creosol                   | 8          | 2           | 25%      | 64                   | 64   | 50                |          |           | 350      | 0                   |
| Phenathrene                 | 8          | 2           | 25%      | 300                  | 300  | 151.5             |          |           | 10       | 1                   |
| Phenol                      | 9          | 3           | 20%      | 1900                 | 1055   | 383.5             |          |           | 10       | 3                   |
| Pyrene                      | 8          | I           | 13%      | 190                  | 190  | 190               |          |           | 210      | 0                   |

Notes:

1) This is the maximum concentration that was every detected of all samples. 2) This is the maximum average concentration of the landfills.

3) Mean does not include non-detects.

4) This is the number of times that the average landfill concentrations exceeded the applicable groundwater standards.

population means. Moreover, these chemicals were detected less than 40% of the time when they were sampled. Because of the conflicting data, it can not be determined whether these contaminants will pose a problem at all C&D landfills. However, leachate from C&D landfills should initially be analyzed for these constituents to ensure that these constituents are not present in harmful concentrations. If a leachate collection system is not installed, leachate wells should be installed so the leachate can be tested. If preliminary testing indicates that the leachate is free of these constituents, than the testing could be discontinued as long as the composition of the waste stream remains the same.

Some possible sources of the contamination include wood products, adhesives, and resins (EPA 1995). Napthalene and m&p-Cresol are used to preserve wood products, particularly wood products that will be exposed to the weather like railroad ties, utility poles, and pilings. Phenol-formaldehyde resins are used as either adhesives or resins on wood products. Phenol is also used as a laminate. Phenols, xylene, napthalene, fluorene, phenanthrene, anthracene, and pyrene have been shown to leach from roofing felt and building insulation (Goumans 1991). Most of these products are applied to wood products. It would be impractical to ban wood products from C&D landfills. However, if a landfill is having a problem with constituents that are leaching from preserved wood, banning preserved wood should help to alleviate the problem.

There are some apparent trends in the data for semi-volatile organic. Of the nine landfills that sampled for these parameters, two landfills account for the majority of the highest concentrations. The Massachusetts site detected seven compounds and had four of the highest concentrations. The Kentucky Site detected four compounds and all four of these were the highest concentrations for the compounds. The Michigan site detected seven compounds also, but had none of the highest concentrations. The other landfills had a smaller number of detected compounds and a lower number of the highest concentrations.

In conclusion, more study is needed to determine if semi-volatile organic compounds contained in C&D leachate will pose a threat to human health and the environment.

### 4.4 Other Organic Compounds

This group includes herbicides, pesticides and dioxans/furans. There were nine organic compounds that fall in this group that were detected at least once. Table 4.3 summarizes the

Table 4.3: Summary of Statistics for Other Organics.

| Parameter  | Sites that | Sites that | Percent  | Max.                 | Max.               | Mean <sup>3</sup> | Primary | Secondary | Guidance | No Of               |
|------------|------------|------------|----------|----------------------|--------------------|-------------------|---------|-----------|----------|---------------------|
|            | Sampled    | Detected   | Detected | Conc.                | Jo                 |                   | MCL     | MCL       | Conc.    | Means Over          |
|            | Parameter  | Parameter  |          | Overall <sup>1</sup> | Means <sup>2</sup> |                   |         |           |          | Limits <sup>4</sup> |
| Alpha-BHC  | 7          | 1          | 14%      | 0.12                 | 0.12               | 0.12              |         |           | 0.05     | -                   |
| Endrin     | 7          | 2          | 29%      | 0.05                 | 0.05               | 90.0              | 2.0     |           |          | 0                   |
| Dieldrin   | 7          | 2          | 29%      | 0.2                  | 0.2                | 0.13              |         |           | 0.10     |                     |
| Dimethoate | 4          | 1          | 25%      | 2.7                  | 2.7                | 2.7               |         |           | 5        | 0                   |
| Disulfoton | 4          | 2          | 20%      | 5.6                  | 5.6                | 3.28              |         |           | 0.5      | 2                   |
| 2,4,5-T    | 4          | 1          | 25%      | 0.53                 | 0.53               | 0.53              |         |           | 70       | C                   |
| 2,4-D      | 4          | 2          | 20%      | 29                   | 29                 | 15.6              | 70      |           |          | 0                   |
| HxCDD      | 4          | 1          | 25%      | 5.5                  | 5.5                | 5.5               |         |           |          | NA                  |
| HxCDF      | 4          | 1          | 25%      | 7.7                  | 7.7                | 7.7               |         |           |          | Ϋ́                  |
|            |            |            |          |                      |                    |                   |         | •         | •        |                     |

1) This is the maximum concentration that was every detected of all samples.
2) This is the maximum average concentration of the landfills.

3) Mean does not include non-detects.
4) This is the number of times that the average landfill concentrations exceeded the applicable groundwater standards.

findings for these parameters. Of these seven compounds, the following three had means that exceeded the applicable groundwater standards:

Alpha-BHC Dieldrin Disulfoton

However, no conclusions can be reached regarding these compounds. Alpha-BHC had a mean concentration of .12 ug/l, which is approximately twice the guidance concentration of 0.05 ug/l. However, alpha-BHC was only detected once out of seven landfills. This low percentage of detection greatly reduces the significance of the mean concentration. Dieldrin had a mean of 0.13 ug/l, which is approximately equal to the guidance concentration of 0.10 ug/l. Dieldrin was detected at two of seven sites. Again, the low percentage of detected values greatly reduces the significance of the mean concentration. Finally, disulfoton had a mean of 3.28 ug/l, which is roughly six times the guidance concentration of 0.5 ug/l. Disulfoton also was detected at fifty percent of the sites that sampled for it. However, only four sites sampled for disulfoton. There is simply not enough data to conclude anything about disulfoton. Because of the low number of samples and the low number of detected values, no conclusions can be reached concerning this group of chemicals.

Although the literature does not identify potential sources for herbicides and pesticides, the source of these chemicals could be vegetation that is accepted at C&D landfills.

There are some trends in the data. Of the seven landfills that tested for these compounds, two landfills account for seven of the nine highest concentrations. The Massachusetts site detected five compounds and had four of the highest concentrations. The Michigan site detected four compounds and had three of the highest concentrations. The other landfills had smaller numbers of detected compounds and the highest concentrations.

In conclusion, more study is needed to determine if herbicides, pesticides and dioxans/furans contained in C&D leachate will pose a threat to human health and the environment.

### 4.5 Heavy Metals

With a few exceptions, heavy metals were sampled frequently, therefore, a statistical analysis was conducted on this group of parameters. The leachate samples were analyzed for fourteen heavy metals. Only thallium was never detected in any sample. Table 4.4 on the following page summarizes the findings for these parameters, including the results of the statistical analysis.

Table 4.4. Summary of Statistics for Heavy Metals.

| Demonster   | Citan that | Citas that | Dorogent   | Morr     | Moss                 | Moon3  | Drimour | And Mary Many Defendent Consultant | Guidonco  | Confidence  | Dogor                 |
|-------------|------------|------------|------------|----------|----------------------|--------|---------|------------------------------------|-----------|-------------|-----------------------|
| raidillelei | ones mar   | ones mar   | רכוכבווו   | IVIAX.   | IVIAA.               | Mean   | rimary  | Secondary                          | Outralice | Collination | LOSCS                 |
|             | Sampled    | Detected   | Detected   | Conc.    | οč                   |        | MCL     | MCL                                | Conc.     | Interval    | Problem? <sup>4</sup> |
|             | Parameter  | Parameter  |            | Overall. | Means <sup>2</sup> . |        |         |                                    |           |             |                       |
| Antimony    | 9          | 1          | 17%        | 5.8      | 6.9                  | 36.23  | 9       |                                    |           | NA          | NA                    |
| Arsenic     | 16         | 12         | 75%        | 77.3     | 46                   | 12.27  | 50      |                                    |           | (0, 24.6)   | No                    |
| Barium      | 13         | 13         | 100%       | 8000     | 4750                 | 661.4  | 2000    |                                    |           | (0, 1592.5) | No                    |
| Cadmium     | 19         | 11         | %85        | 2050     | 512.88               | 31.9   | 5       |                                    |           | (0,100.3)   | Yes                   |
| Chromium    | 18         | 8          | 44%        | 250      | 175                  | NA     | 100     |                                    |           | (0, 20.8)   | No                    |
| Copper      | 18         | 14         | <b>28%</b> | 620      | 315                  | 20.3   | 1000    |                                    |           | (6.9, 59.8) | No                    |
| Lead        | 18         | 12         | %19        | 2130     | 1175                 | 8.82   | 15      |                                    |           | (1.2, 66.2) | Yes                   |
| Mercury     | 15         | 4          | 27%        | 6        | 5                    | NA     | 2       |                                    |           | (0, 0.5)    | No                    |
| Nickel      | 13         | 7          | 54%        | 170      | 120                  | 20.00  | 100     |                                    |           | (8.1, 49.5) | No                    |
| Selenium    | 14         | 1          | 7%         | 5        | 3.41                 | 2.78   | 50      |                                    |           | NA          | No                    |
| Silver      | 11         | 2          | 18%        | 30       | 17.5                 | NA     |         | 100                                |           | (0, 10.4)   | No                    |
| Thallium    | 7          | 0          | %0         | 0        | 0                    | 0      | 2       |                                    |           | (0, 0)      | No                    |
| Vanadium    | 5          | 2          | 40%        | 96       | 42                   | 22.8   |         |                                    | 49        | NA          | No                    |
| Zinc        | 15         | 15         | 100%       | 8630     | 5165                 | 657.70 |         | 5000                               |           | (0, 1501.4) | No                    |

This is the maximum concentration that was every detected of all samples.
 This is the maximum average concentration of the landfills.
 This is the maximum average concentration of the landfills.
 The mean includes non-detects. If a statistical analysis was conducted, the mean is the reported mean is the mean calculated from the stat. tests.
 A parameter poses a problem if the applicable groundwater standard is contained within the confidence interval.

A statistical analysis could not be conducted on the data for antimony, selenium, and vanadium. There was not enough data gathered on antimony and vanadium to conduct a statistical test. Although selenium was analyzed frequently, 93% percent of the data was non-detects. Statistical tests fail when a data set has more than 90% non-detects. Vanadium and selenium should not pose a problem because the mean of the data, including non-detects, fall below the applicable groundwater. The mean for each landfill was calculated as the mean of all data with the non-detects assuming one-half the value of the method detection limit. If the method detection limit for a sample was not known, the method detection limit was provided by either EPA publication SW-846, "Test Methods for Evaluating Solid Waste Physical/Chemical Methods," or EPA publication EPA-600, "Methods for Chemical Analysis of Water and Wastes." The overall mean was determined in the same manner with non-detects assuming one-half the value of the method detection limit.

For antimony, the overall mean calculated in this manner was higher than the maximum concentration every detected. This happened because the method detection limits for some landfills were much higher than the maximum concentration every detected. For antimony, only one site out of seven ever detected the metal and the detected value was less than the groundwater standard. The mean of 36.23 ug/l is very suspect because the non-detects actually increased the mean, instead of decreasing the mean as would normally happen. No conclusions can be drawn from the data that was reported. Further study is needed to conclusively determine if antimony poses a threat to human health and the environment. The only conclusion that can be drawn is that the method used to test for antimony should have a method detection limit less than the groundwater standard of 6 ug/l. From EPA publication SW-846, Method 7041, antimony has a method detection limit of 3 ug/l.

The results of the statistical tests indicate that the following heavy metals could endanger human health and the environment:

Cadmium Lead

The statistical tests are included in Appendix D. For copper, lead, and nickel, the data had to be transformed into the log of the concentration. The statistical analysis was performed on the transformed data, then the results were converted back to the original scale. The confidence intervals were constructed after the data was converted back the original scale. The adjusted

mean calculated by Aitchinson's Method for cadmium is 31.94 ug/l. The confidence interval is (0, 100.3) ug/l. The groundwater standard for cadmium is 5 ug/l. The confidence interval encompasses the mean, therefore it is statistical possible that actual mean for cadmium at C&D landfills is at least 5 ug/l. The mean is six times higher than the groundwater standard. The adjusted mean calculated by Cohen's Method for lead is 8.82 ug/l. The confidence interval is (1.2, 66.2) ug/l. The confidence interval encompasses the mean, therefore it is statistical possible that actual mean for lead at C&D landfills is at least 15 ug/l. In this case the actual adjusted mean is less than the groundwater standard. However, the confidence interval indicates that the actual mean could be as high as 66.2, therefore lead does pose a risk to human health and the environment.

The statistical tests for the remaining nine heavy metals indicate that there is less than a 2% chance that the actual mean is equal to or higher than the applicable groundwater standard.

Therefore, these metals will be classified as not problematic and no further analysis is needed.

### 4.5.1 Box Plots for Heavy Metals

Box plots for several common heavy metals have been developed to show the distribution of the data. Figure 4.1 shows a typical box plot. The box shows the various percentiles for the data. A percentile is a measure of variability. The xth percentile of a set of measurements arranged in order of magnitude is that value that has x% of the measurements below it (Ott 1993). Therefore the 25th percentile is the value that has 25% of the data below it. The ends of the box indicate the 25th and 75th percentile. The hash marks that extend on a line from the boxes indicate the 10th and 90th percentiles. Any circles indicate values beyond the 10th and 90th percentiles. The solid line inside the box shows the median for the data, or the 50th percentile. The dashed line either inside or outside the box shows the mean of the data, or the average. The solid line that extends from the top of the figure to the x-axis shows the applicable groundwater standard for the parameter. Not all box plots will include this line.

Figures 4.2 through 4.7 show the distribution of data for arsenic, barium, cadmium, copper, lead and zinc respectively. The box plots are based on the means values for each parameter from each landfill. As can be seen, there are no data beyond the applicable groundwater standards for arsenic and copper. These figures agree with the statistical analysis, and these parameters do not appear to pose any problems. The 90th percentiles are below the groundwater standards for

Figure 4.1: Box Plot Example

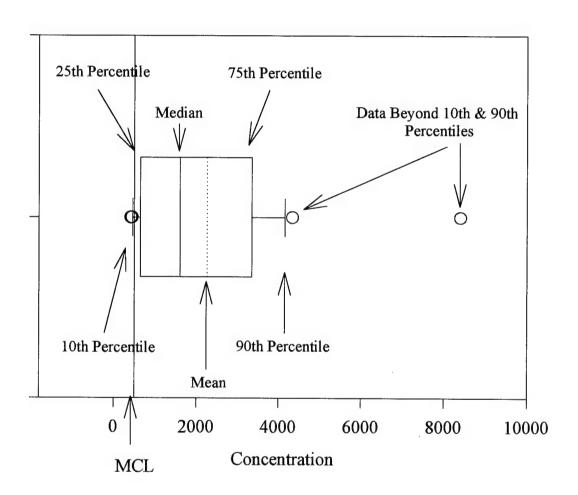


Figure 4.2: Box Plot for Arsenic

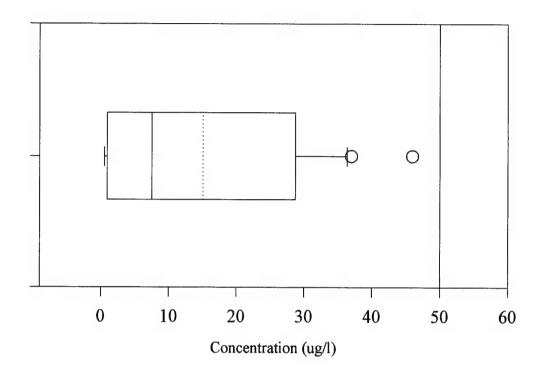


Figure 4.3: Box Plot for Barium

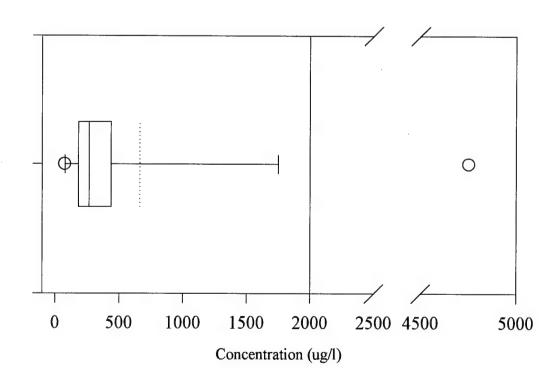


Figure 4.4: Box Plot for Cadmium

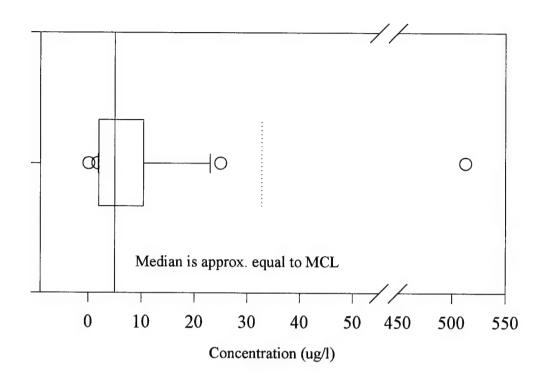


Figure 4.5: Box Plot for Copper

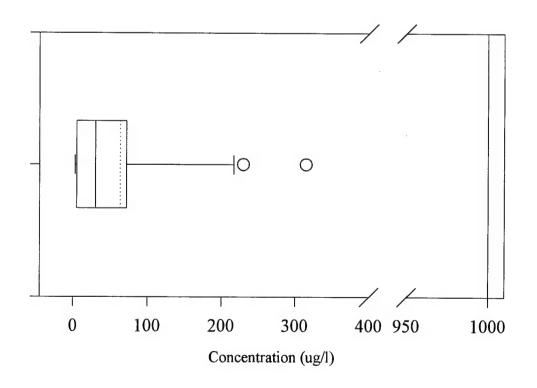


Figure 4.6: Box Plot for Lead

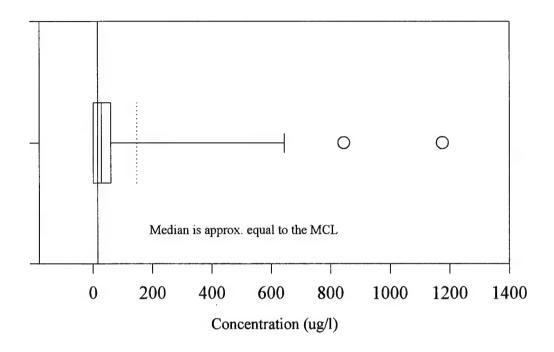
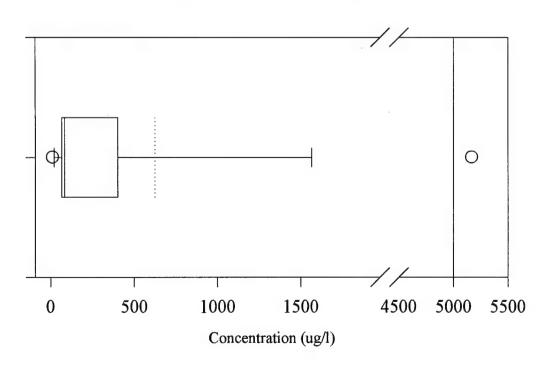


Figure 4.7: Box Plot for Zinc



barium and zinc. Both of these metals have a data point beyond the MCL, but all of the rest of the data are within compliance. The statistical tests for barium and zinc show that the means are below the MCL's with a confidence of 98%. Thus, these metals are also not problems. The box plots for lead and cadmium show that the MCL is exceeded by 50% or more of the data. The median for cadmium is approximately equal to the MCL, therefore, a separate line for the median is not shown on the box plot. The box plots for lead and cadmium support the conclusions of the statistical tests. These metals do pose a risk to human health and the environment.

### 4.5.2 Other Conclusions

There are some discernible trends in the data for the heavy metals. The Sanifill Landfills (three) of Houston, Texas tested for 10 of the heavy metals. Eight of the highest means came from these landfills. Furthermore, nine of the means were in the top one or two values for the particular metals. The 100 Sand Co. Landfill of New York tested for fourteen of the heavy metals. Only two of the means for this landfill were the highest reported among all of the landfills. Five of the means were in the top one or two values for the particular metals. The remaining landfills either did not have any of the high mean values or had only one of the highest or second highest values. It appears that the Sanifill Landfills of Houston were very contaminated in comparison to the remaining landfills. However, removing the Sanifill Landfills from this study would not have significantly changed the results of the statistical tests. Lead and cadmium were sufficiently high at the other landfills to pose a problem, regardless of the contributions from the Sanifill Landfills.

The source of heavy metal contamination is fairly well documented. Many paints and coating contain lead, mercury, arsenic, and cadmium, chromium, barium, and zinc (EPA 1994). Lead is an additive in caulking and is used in flashing. Cadmium, chromium and arsenic are used to preserve would in various chemical forms. Trace amounts of these metals are also included in common metals used for structural members, flashing, electrical wiring and many other forms of metals commonly used in construction. It is hardly surprising that construction and demolition leachate contains elevated levels of heavy metals, knowing all of the potential sources of heavy metals.

### 4.6 Conventional Parameters

With a few exceptions, the conventional parameters were sampled frequently. However, not all conventional parameters have established groundwater standards, therefore, a statistical analysis was conducted only on the conventional parameters that have groundwater standards. The maximum and mean concentrations were reported for all parameters that did not have groundwater standards.

Twenty-seven conventional parameters were tested for at least once. A statistical test was not conducted on the following seventeen parameters because they do not have established groundwater standards:

| Alkalinity | Ammonia-N | Biological Oxygen Demand |
|------------|-----------|--------------------------|
|------------|-----------|--------------------------|

Total Suspended Solids

Table 4.5 on the following page summarizes the findings for these parameters, including the results of the statistical analysis. The statistical tests are included in Appendix D. For nitrate and nitrite, the data had to be transformed into the log of the concentration. The statistical analysis was performed on the transformed data, then the results were converted back to the original scale. The confidence intervals were constructed after the data was converted back the original scale.

Ten conventional parameters have established groundwater standards. With one exception, a statistical test was conducted on these parameters. The exception is boron. Only one site, the Sanifill Landfills of Houston, tested for boron. The highest value of boron at these landfills exceeded the groundwater standards. However, because of the lack of supporting data, no conclusions can be drawn about boron. Six of the ten conventional parameters with groundwater standards could pose a risk to human health and the environment. The results of the statistical tests indicate that the means for the following parameters exceed the appropriate groundwater standard:

| Chlorides | Iron    | Manganese              |
|-----------|---------|------------------------|
| Sodium    | Sulfate | Total Dissolved Solids |

Table 4.5: Summary of Statistics for Conventional Parameters.

|                        |            | 1 able 4.  | 5. Summa | summary of statistics for Conventional Parameters. | Stics for           | onvenue           | onal rarai | neters.   |          |               |          |
|------------------------|------------|------------|----------|--|---------------------|-------------------|------------|-----------|----------|---------------|----------|
| Parameter              | Sites that | Sites that | Percent  | Max.   | Max.                | Mean <sup>3</sup> | Primary    | Secondary | Guidance | Confidence    | Poses    |
|                        | Sampled    | Detected   | Detected | Conc.  | Oť                  |                   | MCL        | MCL       | Conc.    | Interval      | Problem? |
|                        | Parameter  | Parameter  |          | Overall <sup>1</sup> .                             | Means. <sup>2</sup> |                   |            |           |          |               | 4        |
| Alkalinity             | 12         | 12         | %001     | 6520   | 4115                | 964.73            |            |           |          | NA            | NA       |
| Ammonia (N)            | 17         | 16         | %46      | 480  | 138.93              | 20.42             |            |           |          | NA            | NA       |
| BOD                    | 14         | 14         | 100%     | 920  | 530                 | 87.32             |            |           |          | NA            | NA       |
| Boron                  | 1          | 1          | 100%     | 3.9  | 2.65                | 2.65              |            |           | 69.0     | NA            | NA       |
| Calcium                | 9          | 9          | 100%     | 009  | 480                 | 274.3             |            |           |          | NA            | NA       |
| COD                    | 17         | 16         | 94%      | 11200  | 7140                | 754.5             |            |           |          | NA            | NA       |
| Chlorides              | 20         | 20         | 100%     | 1400   | 795.3               | 157.6             |            | 250       |          | (52.7, 262.5) | Yes      |
| Cyanide                | 13         | 8          | 62%      | 0.34   | 0.09                | 0.010             | 0.2        |           |          | (0, 0.04)     | No       |
| Hardness               | 9          | 9          | 100%     | 2420   | 480                 | 274.3             |            |           |          | NA            | NA       |
| Iron                   | 20         | 20         | 100%     | 5206   | 275.11              | 36.76             |            | 0.30      |          | (1.8, 71.7)   | Yes      |
| Magnesium              | 9          | 9          | 100%     | 460  | 224                 | 117.63            |            |           |          | NA            | NA       |
| Manganese              | 13         | 13         | 100%     | 258  | 76.38               | 8.71              |            | 0.050     |          | (0, 23.9)     | Yes      |
| Nitrate                | 12         | 8          | 67%      | 13   | 8.50                | 0.45              | 10         |           |          | (0.1, 1.7)    | No       |
| Nitrite                | 8          | 6          | 75%      | 0.047  | 60.                 | 90.0              | 1          |           |          | (0.01, 0.5)   | No       |
| Oil & Grease           | 6          | 7          | 78%      | 50   | 45                  | 15.31             |            |           |          | NA            | NA       |
| Organic N              | 10         | 10         | 100%     | 190  | 20.75               | 5.70              |            |           |          | NA            | NA       |
| pH                     | 15         | 15         | 100%     | 8  | 7.60                | 6.95              |            | 6.5-8.5   |          | (6.7, 7.2)    | No       |
| Phenols                | 7          | 7          | 100%     | 4.9  | 2.23                | 0.62              |            |           |          | NA            | NA       |
| Phosphorus             | ∞          | 7          | %88      | 3.89   | 3.20                | 1.06              |            |           |          | NA            | NA       |
| Potassium              | 8          | 8          | 100%     | 618  | 368                 | 101.33            |            |           |          | NA            | NA       |
| Sodium                 | 11         | 11         | 100%     | 1290   | 773                 | 162.63            | 160        |           |          | (0, 355.3)    | Yes      |
| Specific Conductance   | 10         | 10         | 100%     | 6850   | 4885                | 1666.2            |            |           |          | NA            | NA       |
| Sulfate                | 17         | 16         | 94%      | 1700   | 1126                | 253.72            |            | 250       |          | (0, 443.8)    | Yes      |
| Total Dissolved Solids | 18         | 17         | 94%      | 8400   | 8400                | 2263.1            |            | 500       |          | (992, 3534)   | Yes      |
| Total Organic Carbon   | 7          | 7          | 100%     | 2100   | 926.00              | 306.54            |            |           |          | NA            | NA       |
| Total Organic Halogens | 4          | 4          | 100%     | 0.91   | 0.61                | 0.36              |            |           |          | NA            | NA       |
| Total Suspended Solids | 18         | 17         | 94%      | 43000  | 22000               | 1859.1            |            |           |          | NA            | NA       |
|                        |            |            |          |  |                     |                   |            |           |          |               |          |

Notes: See Notes from Table 4.4.

Iron, manganese and total dissolved solids had means that were dramatically higher than their groundwater standards. There is little doubt that these three parameters will pose a problem. The means for chloride, sodium, and sulfate were only slightly higher than their groundwater standards. Although the statistical test indicates that they could pose a problem, they will pose less of a problem than iron, manganese, and total dissolved solids. Concentrations for chloride, sodium, and sulfate could be less than the applicable standards at groundwater monitoring wells surrounding the C&D landfills. In all cases, the applicable groundwater standard is a secondary standard. Secondary standards are intended to protect water supplies for aesthetic reasons (taste, color) rather than health-based reasons (EPA 1995). This means that although the groundwater could be degraded, there is no increased risk to human health.

### 4.6.1 Box Plots for Conventional Parameters

Box plots for several conventional parameters of interest have been developed to show the distribution of the data. Figure 4.1 shows a typical box plot. Refer to section 4.5.1 for an explanation of the typical box plot. Figures 4.8 through 4.17 show the distribution of data for ammonia, COD, chlorides, hardness, iron, manganese, sodium, specific conductance, sulfate, and total dissolved solids respectively.

Ammonia, COD, Hardness, and specific conductance do not have established groundwater standards, therefore, the box plots simply show the distribution of the data. Figure 4.8 shows the data for ammonia. The median is less than 5 mg/l and the average is approximately 20 mg/l. The data are grouped into low concentrations and high concentrations as is evident by the box plot. The median and 10th percentile are very close to each other, but the 75th and 90th percentile and spread out and much higher than the median. The average concentration is 20.42 mg/l, which is approximately equal to the 75th percentile. Figure 4.9 shows the data for COD. Again, the data seem to be distributed between high and low values, but the data are not as spread out as ammonia. The median is located around 250 mg/l, with the mean concentration equal to 754.5 mg/l. There are several data points beyond the 90th percentile, with the highest concentration at over 7000 mg/l. Figure 4.11 shows the data for hardness. The data are distributed more evenly, although the median is still toward the lower end of the data. The mean is located at 771.80 mg/l and the median is at approximately 500 mg/l. There are several data points beyond the 90th percentile with the highest concentration being 2114 mg/l. Figure 4.15 shows the data for specific

Figure 4.8: Box Plot for Ammonia-N

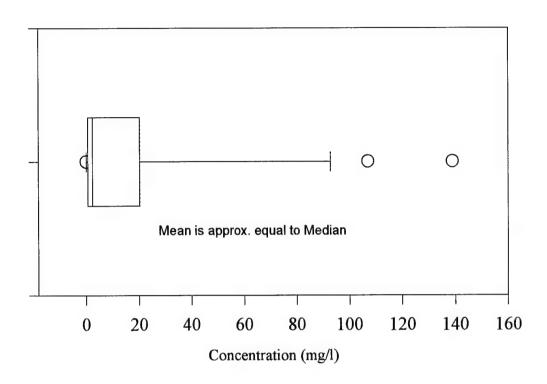


Figure 4.9: Box Plot for Chemical Oxygen Demand

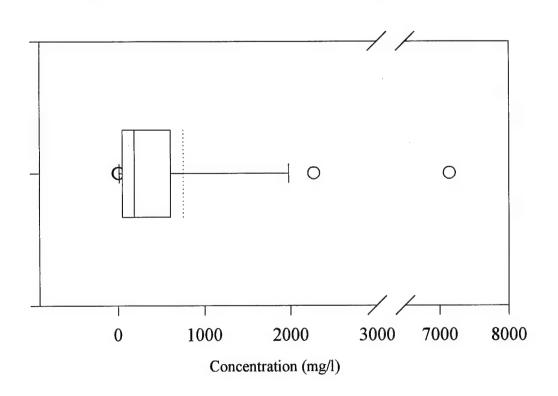


Figure 4.10: Box Plot for Chlorides

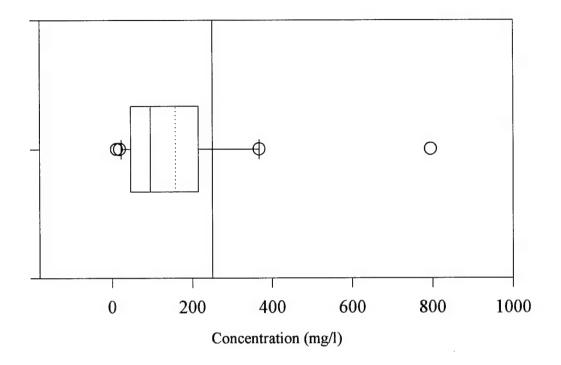


Figure 4.11: Box Plot for Hardness

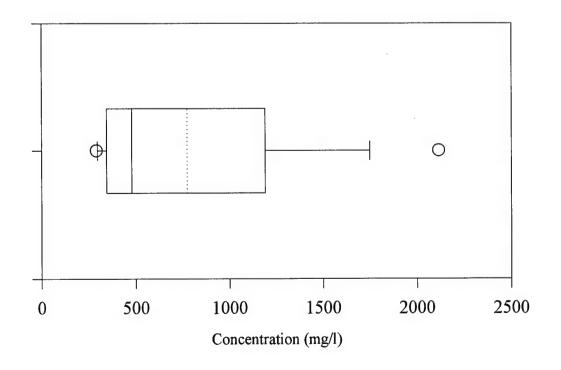


Figure 4.12: Box Plot for Iron

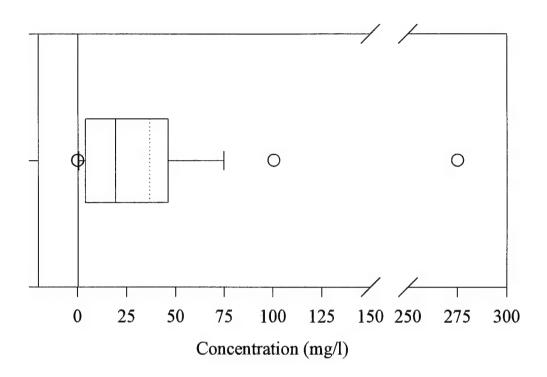


Figure 4.13: Box Plot for Manganese

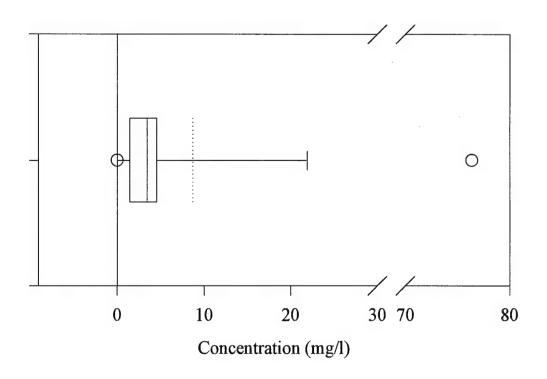


Figure 4.14: Box Plot for Sodium

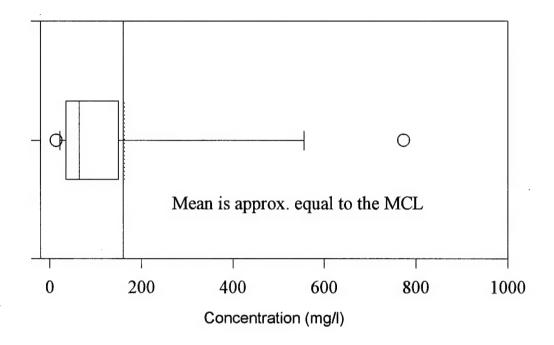


Figure 4.15: Box Plot for Specific Conductance

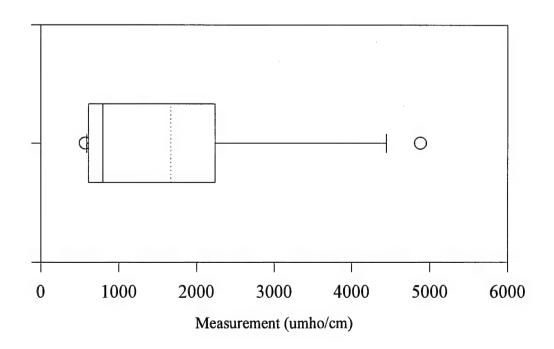


Figure 4.16: Box Plot for Sulfate

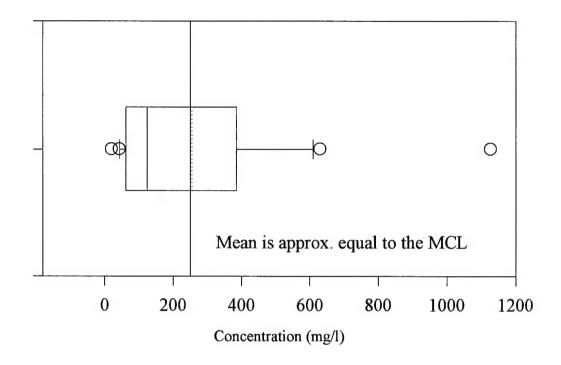
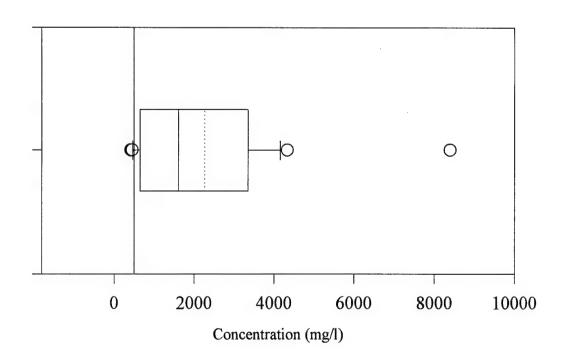


Figure 4.17: Box Plot for Total Dissolved Solids



conductance. Again, the data are distributed between high and low values. The median is located very close to the 10th percentile, and the mean is higher and located closer to the 75th percentile. There are some data points beyond the 90th percentile with the highest concentration being 4885 umho/cm. The mean is equal to 1666.2 umho/cm with the median at approximately 750 umho/cm.

Chloride, iron, manganese, sodium, sulfate, and total dissolved solids have groundwater standards. The standards are shown as the solid line from axis to axis on the box plots. Figure 4.10 shows the data for chlorides. The statistical test for chloride indicates that it is a potential problem. The box plot does not strongly support this conclusion. Over 75% of the data are less than the groundwater standard. The 90th percentile and two other data points are above the standard. Since the statistical test is based on a 98% probability, the statistical test shows that the mean could be equal to or higher than the standard. A review of the box plot would indicate that chloride is mostly within standards. Since the leachate will be diluted by groundwater, it is doubtful whether the groundwater monitoring wells would show that chlorides exceed the standards. Although the statistical test indicates that chloride is a problem, the box plot shows that chloride is more likely to be within standards. More research on chlorides in leachate would clear up this confusion.

Figures 4.12, 4.13 and 4.17 show the data for iron, manganese, and total dissolved solids respectively. There is no doubt that these parameters are problems in C&D leachate. The groundwater standards for all three parameters are at or below the 10th percentile, therefore the vast majority of the data are higher than the standards. The box plots strongly support the conclusions of the statistical tests for these parameters, therefore, iron manganese, and total dissolved solids are present in C&D leachate at levels exceeding the groundwater standards.

Figure 4.14 shows the data for sodium. Like chloride, over 75 percent of the data are less than the applicable standard. The 90th percentile and a data point are above the standard. The statistical test indicates that sodium is a problem, but the box plot does not strongly support this conclusion. There are only three mean values that are over the standard with the highest of 773 mg/l far exceeding the 90th percentile. Although the statistical test indicates that sodium is a problem, the box plot shows that sodium is more likely to be within standards. Further research is

needed to determine whether this highest value is an anomaly or if there is just not enough data in this study to adequately represent the population.

Figure 4.15 shows the data for sulfate. A significant percentage of the data for sulfate exceeds the groundwater standard. The mean of 253.72 mg/l is slightly higher than the standard of 250 mg/l. The 75th and 90th percentiles exceed the standard. The box plot clearly supports the conclusion of the statistical test. Sulfate does pose a problem in C&D leachate.

In conclusion, the box plots show that iron, manganese, total dissolved solids, and sulfate pose problems in C&D leachate. Further research is necessary to determine whether sodium and chloride are actually problems in C&D leachate.

### 4.6.2 Other Conclusions

There are trends apparent in the data for conventional parameters. Three landfills account for the majority of the highest and second highest mean values seen in the data. The Sanifill Landfills of Houston, Texas, account for 9 of the highest and 6 of the second highest mean values of the conventional parameters. A similar trend was seen in the data for the heavy metals. The Sand Co. Landfill of New York accounts for 4 of the highest and 5 of the second highest mean values. Again, a similar trend was seen in the data for heavy metals. The Massachusetts site accounts for 3 of the highest and 3 of the second highest mean values. A similar trend was seen in the data for volatiles, semi-volatiles and other organic parameters. The remaining landfills either did not have any of the high mean values or had only one of the highest or second highest values. It appears that the Sanifill Landfills of Houston and the Sand Company Landfill were very contaminated in comparison to the remaining landfills.

Removing these landfills from this study would have deleted the data beyond the 90th percentile for both chloride and sodium. This change would have changed the results of the statistical tests. The confidence interval for chloride would be (59.58, 188.58), which does not contain the groundwater standard of 250 mg/l. The confidence interval for sodium would be (0, 111.11), which does not contain the groundwater standard of 160 mg/l. The statistical tests would indicate that chloride and sodium are not problems. This conclusion is more in line with the data shown in the box plots for these parameters. It gives more evidence that the statistical test is too conservative and sodium and chloride are probably not problems in C&D leachate.

Removing these landfills from the study would not have changed the conclusions reached concerning iron, manganese, total dissolved solids, and sulfate. Iron, manganese, and sulfate were sufficiently high at the other landfills to pose a problem, regardless of the contributions from the Sanifill Landfills and Sand Co. Landfill. The highest concentrations for sulfate were seen at other landfills, therefore, removing these landfills from the study would not have changed the results of the statistical test.

The conventional parameters are normally seen in municipal landfills, therefore, it is not surprising that the conventional parameters are seen in C&D leachate. Iron and manganese are present in a large percentage of the metals disposed of at C&D waste landfills. Sulfate is a constituent of the gypsum drywall that makes up a significant portion of C&D waste (EPA 1994). Sodium, potassium, calcium, and chloride can leach from concrete and cement compounds (Goumans 1991). Decaying organic matter such as cardboard, paper, and vegetation will produce elevated levels of COD and ammonia. The literature sources have not attempted to explain the high level of total dissolved solids explicitly. However, C&D waste often includes a large portion of fines. Fines may include dirt, crushed drywall, wood, paint products, and concrete. As particle size decreases, chemicals such as sodium, calcium, potassium, and chromium will leach into liquids more readily (Goetz and Glaseker 1991). The smaller particle size of the fines could contribute to the higher content of dissolved solids.

### 5.0 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

Based on the results of the statistical analysis, and box plots for selected parameters, the following parameters in C&D leachate could present a risk to human health and the environment because they exceed either primary groundwater standards or guidance concentrations that are based on health risks:

Methylene Chloride 1,2-Dichloroethane Cadmium Lead

The data indicate that some degradation of groundwater could occur because of the presence of these contaminants. It cannot be determined from this study how far the contaminants will spread from a disposal site or if the levels of these contaminants are high enough to contaminant groundwater monitoring wells.

The data show that the following parameters should exceed secondary groundwater standards:

Groundwater in the vicinity of C&D landfills will be degraded. There is a high probability that groundwater monitoring wells will contain iron, manganese, and total dissolved solids in excess of the groundwater standards because of the extremely high levels of these contaminants in C&D leachate. It cannot be determined if the levels of sulfate present in C&D leachate are high enough to contaminant groundwater monitoring wells. It should be noted that while the concerns regarding leachate generated from C&D waste landfills has resulted from contaminants resulting from hazardous waste, contamination may also result from the "clean" fraction of the C&D waste stream.

### 5.2 Recommendations

Regulators at the EPA proposed standards for non-municipal solid waste facilities in May 1995. The standards include the minimum criteria of location restrictions, groundwater monitoring as necessary to detect contamination, and corrective action (Federal Register 1995). Regulators believe that C&D facilities, in general, do not pose significant risks to the environment. The proposed standards are sufficient to minimize risk to the environment with one exception. This investigator feels there is sufficient evidence that leachate produced from C&D

landfills could degrade groundwater in the immediate vicinity of the site and that several contaminants could pose a risk to human health and the environment. Because of the risk for damage to human health and the environment, C&D waste landfills should be required to prove that they have the financial resources to mitigate any damage caused by the C&D waste landfill. Requiring financial assurance would eliminate operators that do not have the financial resources to correct damage caused by the landfill. The final standards for non-municipal solid waste facilities should require financial assurance.

Because there are insufficient data concerning volatile organics, semi-volatile organics, and other organics such as pesticides and herbicides, further research is required to determine if these classes of contaminants are present in sufficient amounts to endanger human health and the environment. Further research is also required to determine whether sodium and chlorides are actually present in C&D leachate in quantities exceeding the applicable secondary groundwater standards. Until more research is conducted, operators of C&D waste landfills should conduct, at a minimum, annual testing for volatiles, semi-volatiles and other organics to ensure that these contaminants are not entering the groundwater.

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# APPENDIX A: SUMMARY OF LANDFILLS & SAMPLING DATA

APPENDIX B:
TEST METHODS
&
METHOD DETECTION LIMITS

APPENDIX C: PROBABILITY PLOTS

APPENDIX D: STATISTICAL TESTS

Copies of these Appendices are not included here. Copies can be obtained from:

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## APPENDIX A:

SUMMARY OF LANDFILLS &
SAMPLING DATA

Table A.1. Characteristics of the Armetta Landfill of Connecticut.

LANDFILL:

Armetta Landfill.

OWNER/OPERATOR:

Unknown

LITERATURE SOURCE:

Construction and Demolition Waste Landfills.

Prepared by ICF Incorporated for

the U.S. Environmental Protection Agency, Office of Solid Waste.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

Unknown.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Unknown.

MISCELLANEOUS:

None.

Table A.2: Sampling for the Armetta Landfill of Connecticut.

|  | Re       |            | Det Limit | Regult    |          | Det Limit | Result | -       | Det Limit | MCL      | MCL     | Cent     |
|--|----------|------------|-----------|-----------|----------|-----------|--------|---------|-----------|----------|---------|----------|
| Volatiles                                  | San<br>n | DINS       | L         | L/dn      | DANS     |           | 1/41   | NDVNS   |           | l/an     | Van     | 5        |
| Acetone                                    |          | SN         |           | t         | SZ.      |           |        | SZ      |           |          |         | 7000     |
| -Butanone                                  |          | Ne         |           | T         | 201      | T         |        | No      |           |          |         | 5 6      |
| Carbon Distillede                          |          | Ne         |           | Ť         | 2 2      | T         | Ī      | 2 2     |           |          |         | 3        |
| Thomashana                                 |          | SIA SIA    |           | †         | 2 5      |           |        | SN S    |           |          |         | 200      |
| 1 Dichloroethane                           |          | S S        |           | t         | 2 2      | 1         |        | SN      |           |          |         | 200.00   |
| 2 Dichloroethane                           |          | oly<br>oly |           | †         | 2 5      | T         |        | 22      |           |          |         | 3        |
| 1 4-Doxane                                 |          | SN         | 1         | T         | 2 2      |           |        | Sign    | •         | 3.6      |         | 8        |
| thulbenzene                                |          | NIG        |           | T         | 2 2      | T         |        | S I     |           |          | 200 00  | 3.8      |
| Manual Edud Vacana (MEDV)                  |          | CN         |           | t         | 2        | Ī         |        | S.      |           |          | /00.00  |          |
| Mediyi Ediyi Nettille (MEN)                |          | 200        |           | †         | 2        | 1         | Ī      | e :     |           |          |         | 4700.00  |
|  |          | SS         |           | 1         | SS       |           |        | NS      |           |          |         |          |
| Methylene Chloride                         |          | NS         |           |           | SS       |           | Ì      | NS      |           | \$.00    |         |          |
| Toluene                                    |          | NS         |           |           | NS       |           |        | NS      |           | 1000.00  |         |          |
| .1,1 Trichloroethane                       |          | NS         |           | Г         | NS       |           |        | NS      |           | 200.00   |         |          |
| Trichloroethylene                          |          | NS         | _         | T         | SN       | Ī         |        | SZ      |           | 3.00     |         |          |
| inchlorofluoromethane                      |          | SZ.        |           | t         | SZ.      |           |        | SZ.     |           |          |         | 2100 00  |
| Xulanas (Total)                            |          | Me         |           | t         | SIA.     |           |        | MIC     |           | 000001   |         |          |
|  | -        |            | 1         | t         |          | 1         |        | CAT     |           | 10000.00 |         |          |
| Comi Volotiles                             | 000      | SWON       |           | t         | N.D. Oak |           | 1      | NDAN    |           | 9        |         | 1        |
| Samue 1-uma                                | I/An     | CUINI      | •         | 14        | CNIMA    |           | à      | NUMS    |           | A        | ı/Ân    | 120      |
| Acenaphinene                               |          | SS         |           | 1         | SN       |           |        | NS      |           |          |         | 20.00    |
| Acetophenone                               |          | NS         |           | 1         | NS       |           |        | SZ      |           |          |         | 700.0    |
| Вепzепе                                    |          | NS         |           |           | NS       |           |        | NS      |           | 1.00     |         |          |
| Senzoic Acid                               |          | NS         |           |           | NS       |           |        | NS      |           |          |         | 28000.00 |
| 3is(2-Ethylhexyl)phthalate                 |          | SZ         |           | T         | 82       |           |        | SZ      |           |          |         |          |
| 2.4-Dimethylphenol                         |          | 82         |           | t         | ž        | l         |        | ž       |           |          |         | 400      |
| Din Buth phthalate                         |          | NIG        |           | T         | 2 2      | Ì         |        | 2       |           |          |         |          |
| A CONTRACTOR                               |          | c si       |           | †         | S. S.    |           |        | S.      |           |          |         | 2.00     |
| Laculyi Finishate                          | -        | S          |           | 1         | 2        |           |        | SZ.     |           |          |         | 2000.00  |
| rinoranuene                                |          | 2          |           | †         | 2        | Ì         |        | S       |           |          |         | 280.0    |
| Napthalene                                 |          | SZ         |           | 1         | SS       |           |        | NS      |           |          |         | 9.80     |
| in&p-Creosol                               |          | SS         |           |           | SS.      |           |        | SN      |           |          |         | 35.00    |
| o-Creosol                                  |          | NS         |           | 7         | NS       |           |        | NS      |           |          |         | 350.0    |
| henathrene                                 |          | SS         |           |           | NS       |           |        | NS      |           |          |         | 10.00    |
| Phenol                                     |          | NS         | _         |           | NS       |           |        | NS      |           |          |         | 10.00    |
| Рутепе                                     |          | NS         |           |           | NS       |           |        | NS      |           |          |         | 210.00   |
|  |          |            |           |           |          |           |        |         |           |          |         |          |
| Herbicides/Pesticides                      | l/an     | ND/NS      | 2         | l/an      | ND/INS   |           | l/ån   | SN/QN   |           | 1/an     | l/an    | l/dn     |
| Alpha-BHC                                  |          | SN         |           |           | NS       |           |        | NS      |           |          |         | 0.05     |
| Endrin                                     |          | SN         |           |           | NS       |           |        | NS      |           | 2.00     |         |          |
| Dieldrin                                   |          | SN         |           |           | NS       |           |        | SN      |           |          |         | 0.10     |
| Dimethoate                                 |          | o'N        | _         | T         | v Z      |           |        | NA.     |           |          |         | 5        |
| Jiens foton                                |          | NIG.       |           | t         | Ne se    | T         | T      | N.C.    |           |          |         | 5        |
| 2 1 6 Th                                   |          | S. S.      | 1         | t         | CN S     |           |        | 2       |           |          |         | 20.2     |
| 4,7-1                                      |          | Z Z        |           | †         | 2 5      | 1         |        | SZ      |           |          |         | 3.0      |
| U-4-7                                      |          | Z S        | 1         | 1         | 2        |           |        | SN      |           | 70.00    |         |          |
| HXCDD                                      |          | SN         |           | 7         | 2        | 1         |        | NS      |           |          |         |          |
| 1xCDF                                      | 1        | SZ.        | +         | 1         | SS       | Ì         |        | NS      |           |          |         |          |
| 11 17                                      | 9-11     | 2000       |           | +         | o lo dia |           |        | O'CO'CO |           |          |         | 1        |
| reary menas                                | iân      | CAMAN      | 7         | I A       | CNICA    |           |        | SMUNIS  |           | idn.     | n and   |          |
| Antanony                                   |          | 2          | +         | $\dagger$ | 2        |           |        | 2       |           | 00.0     |         |          |
| Arseinc                                    |          | 2 5        | 1         | T         | 2        | 1         |        | S. S.   |           | 30.00    |         |          |
| Sartim                                     | 9        | CN         | 18        | ,         | 2        | T         | 00.00  | S       |           | 2000.00  |         |          |
| Cautoun                                    | 10.00    | 4          | 30        | 3 8       | 1        |           | 00.07  |         |           | 00.00    |         |          |
| - II Cilbran                               | 00 00    | 7          | 746       | 3 8       | T        | T         | 20.50  |         |           | 10000    |         |          |
| Lead                                       | 40.00    |            | 36        | 360.00    |          | Ī         | 110.00 |         |           | 15.00    |         |          |
| derolity                                   |          | SN         |           | 1         | SN       | Ī         | 200    | NZ.     |           | 2.00     |         |          |
| Nickel                                     | 00 00    | 2          | 120       | 20 00     |          |           | 100.00 | CAL     |           | 100 00   |         |          |
| Selemina                                   | 20.00    | SIZ.       |           | 3         | Nic      | 1         | N.W.   | NIC     |           | 20.05    |         |          |
| Series .                                   |          | SN         |           | t         | S N      |           |        | S N     |           | 20.00    | 100 00  |          |
| Dallium                                    |          | SN         |           | t         | S N      |           |        | S Z     |           | 2.00     | 00:00   |          |
| Vanadum                                    |          | S P        |           | T         | S N      | 1         |        | 207     |           | 7.00     |         | 40.00    |
| and an |          | 2          |           |           | 3        | 1         | 1      | 2       |           |          |         | 47.00    |
| Zino                                       | 240.00   | _          | 177.      | 5         | _        |           | 2000   |         |           |          | 2000 00 |          |

| NS   | 2,4-D  |         | NS    |            | NS           |                | SS    | 3       |         |       |
|--|--|---------|-------|------------|--------------|----------------|-------|---------|---------|-------|
| No.  | HxCDD  |         | NS    |            | N3           |                | SN    |         |         |       |
| yellowing         ugf1         NDNS         ugf1         NDNS   | HxCDF  |         | SZ    |            | SN           |                | SN    |         |         |       |
| y         NDNS         ug/l         NDNS         ug/l         NDNS         ug/l         NDNS         ug/l         NDNS         ug/l         NDNS         ug/l         NDNS         NS         NS <t< td=""><td>The state of the s</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | The state of the s |         |       |            |              |                |       |         |         |       |
| y         NS         NS         NS         NS           n         NS         NS         NS         NS           n         NS         NS         NS         NS           n         1000         NS         120.00         NS         NS           n         4000         NS         440.00         NS         NS         NS           n         4000         NS         NS         NS         NS         NS           n         NS         NS         NS         NS         NS         NS           n         NS         NS         NS <t< td=""><td>leavy Metals</td><td>ng/J</td><td>ND/NS</td><td>/ån</td><td>ND/NS</td><td>VA.</td><td>ND/NS</td><td>ng/l</td><td>l∕an</td><td>√an</td></t<>   | leavy Metals   | ng/J    | ND/NS | /ån        | ND/NS        | VA.            | ND/NS | ng/l    | l∕an    | √an   |
| NS   NS   NS   NS   NS   NS   NS   NS  | Antúmony   |         | NS    |            | NS           |                | NS    | 00.9    |         |       |
| n         NS         NS         NS         NS           n         3000         ND         12000         NS         NS           n         5000         NS         11000         NS           n         3000         NS         11000         NS           n         9000         NS         17000         NS           n         NS         NS         NS         NS <td>Arsenic</td> <td></td> <td>NS</td> <td></td> <td>NS</td> <td></td> <td>NS</td> <td>20.00</td> <td></td> <td></td>   | Arsenic  |         | NS    |            | NS           |                | NS    | 20.00   |         |       |
| 10.00   ND   10.00   | Barium   |         | SN    |            | NS           |                | NS    | 2000.00 |         |       |
| 120 00   NS   120 00   NS   100 00   NS   100 00   NS   100 00   NS   100 00   NS   NS   NS   NS   NS   NS   NS  | Cadınıun   | 10.00   |       | 30.00      |              | 20.00          |       | 5.00    |         |       |
| No.  | Chromium   |         | ND    | 120.00     |              | 00:09          |       | 100.00  |         |       |
| 100   NS   100   NS   100   NS   NS   NS   NS   NS   NS   NS   | Copper   | 50.00   |       | 440.00     |              | 200.00         |       | 1000.00 |         |       |
| 100   NS   NS   NS   NS   NS   NS   NS   | Lead   | 40.00   |       | 360.00     |              | 110.00         |       | 15.00   |         |       |
| NS   NS   NS   NS   NS   NS   NS   NS  | Mercury  |         | NS    |            | Ц            |                | Ц     | 2.00    |         |       |
| NS   NS   NS   NS   NS   NS   NS   NS  | <b>dickel</b>  | 90.06   |       | 170.00     | Ц            | 100.00         |       | 100.00  |         |       |
| NS   NS   NS   NS   NS   NS   NS   NS  | Selenium   |         | NS    |            | NS           |                | NS    | 50.00   |         |       |
| NS   NS   NS   NS   NS   NS   NS   NS  | Silver   |         | NS    |            | NS           |                | NS    |         | 100.00  |       |
| December  | Thallium   |         | NS    |            | NS           |                | NS    | 2.00    |         |       |
| Page  | Vanadinn   |         | NS    |            | 4            |                | 4     |         |         | 49 00 |
| April  | Zinc   | 240.00  |       | 2600.00    |              | 610.00         |       |         | 2000 00 |       |
| Decided Solids   |  | ·       |       |            |              |                | -     | 1       |         | ľ     |
| A  | onventional Parameters   | III (   | ND/NS | l/gm       | ND/NS        | l'ân           | SN/QN | l/aca   | Ìu.     | /am   |
| Nitrogen   1000   NS   NS   NS   NS   NS   NS   NS   | Sichogoda Oxygen Demand  | 23.00   | SZ.   | 00000      | 4            | 20,000         | 4     | 1       |         |       |
| 10   | Alema Oxygen Denimic   | 00.00   |       | 880.00     | +            | 00 000         | 4     | 1       | 300     |       |
| ia, Nitrogen         5 00         11 00         2 00         10 0           Nitrogen         5 00         11 00         5 00         10 0           O 01         0 01         0 01         0 01         0 01           Crease         1 1 10         10 00         10 00         10 0           Grease         1 1 10         NS         NS         NS           Crease         NS         NS         NS         NS           NS         NS         NS         NS         NS           Sapended Solids         15 00         NS         NS         NS           Sached Solids         15 00         NS         NS         NS           Paramic Carbon         NS         NS         NS         NS           Sached Solids         15 00         NS         NS         NS           Interest         NS         NS         NS         NS           Interest         NS         NS         NS         NS           Interest         1 20         NS         NS         NS           Interest         1 20         NS         NS         NS           Interest         1 20         NS         NS   | Cyanide  | 90.00   | 57    | 140.02     | $\downarrow$ | 300            | +     | 0 20    | 70.007  |       |
| Nitrogen   5 00  | Annonia Nitrogen   | 2 00    |       | 11 00      |              | 200            |       |         |         |       |
| O 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  | Organic Nitrogen   | 2.00    |       | 811        |              | 200            |       | T       |         |       |
| O 0 1  | Litrate  | 0.04    |       | 0.44       |              | 0.24           |       | 10.00   |         |       |
| Grease         1.10         NS         5.50         NS           (Total)         NS         NS         NS         NS           rus         NS         NS         NS         NS           spended Solids         15.00         NS         NS         NS           panic Carbon         NS         NS         NS         NS           panic Carbon         NS         NS         NS         NS           panic Halogens         NS         NS         NS         NS           min         NS         NS         NS         NS           min         NS         NS         NS         NS           m         NS <td>Litrite</td> <td>0.01</td> <td></td> <td>0.01</td> <td></td> <td>0.01</td> <td></td> <td>1.00</td> <td></td> <td></td>   | Litrite  | 0.01    |       | 0.01       |              | 0.01           |       | 1.00    |         |       |
| Grease         NS         NS         NS           (Total)         NS         NS         NS           rus         NS         NS         NS           rus         NS         NS         NS           spended Solids         15.00         NS         A50.00         NS           ssolved Solids         2700.00         NS         A50.00         NS           psanic Carborn         NS         NS         NS         NS           psanic Halogens         NS         NS         NS         NS           m         NS         NS         NS   | ron  | 1.10    |       | 10.00      |              | 5.50           |       |         | 0.30    |       |
| (Total)         NS         NS         NS           syrula         NS         NS         NS           syrula         NS         NS         NS           gamic Carborn         NS         499,00         NS         NS           gamic Carborn         NS         NS         NS         NS           gamic Carborn         NS         NS         NS         NS           quibicate)         NS         NS         NS         NS           min         NS         NS         NS         NS           min         NS         NS         NS         NS           min         NS         NS         NS         NS           m         NS         NS         NS         NS           m         NS         NS         NS         NS           m         NS         NS         NS         NS  | Dil and Grease   |         | NS    |            | SX           |                | SN    |         |         |       |
| (Total)         NS         NS         NS           ritts         NS         NS         NS           septicaled Solids         15.00         A200.00         A25.00         NS           ssolved Solids         2700.00         NS         A200.00         A35.00         NS           gaunc Carbon         NS         NS         NS         NS         NS           gaunc Halogents         NS         NS         NS         NS           gaunc Halogents         NS         NS         NS         NS           m         NS         NS         NS         NS           etc         120         NS         NS         NS           m         NS         NS         NS         NS           n         NS  | Н  |         | NS    |            | NS           |                | NS    |         | 6.8-8.5 |       |
| rotate         NS         NS <th< td=""><td>henols (Total)</td><td></td><td>NS</td><td></td><td>NS</td><td></td><td>SN</td><td></td><td></td><td></td></th<>   | henols (Total)   |         | NS    |            | NS           |                | SN    |         |         |       |
| spended Solids         15.00         499,00         245 00         245 00           ssolved Solids         2700,00         NS         NS         NS           panic Carborn         NS         NS         NS         NS           publicate Date Halogents         NS         NS         NS         NS           mun         NS         NS         NS         NS           m         NS         NS         NS         NS           m         NS         NS         NS         NS           y         750.00         NS         NS         NS           y         NS         NS         NS         NS   | Phosphorus   |         | NS    |            | Ц            |                | Ц     |         |         |       |
| ssolved Solids         2700 000         4200 00         3450 00           Panic Carbon         NS         NS         NS           panic Halogents         NS         NS         NS           nun         NS         NS         NS         NS           nun         NS         NS         NS         NS           nn         NS         NS         NS         NS           nn         NS         NS         NS         NS           n         NS         NS         NS         NS           n <t< td=""><td>Fotal Suspended Solids</td><td>15.00</td><td></td><td>490.00</td><td></td><td>245 00</td><td></td><td></td><td></td><td></td></t<>  | Fotal Suspended Solids   | 15.00   |       | 490.00     |              | 245 00         |       |         |         |       |
| panic Carbon         NS         NS         NS           uplicate)         NS         NS         NS           genue Halogens         NS         NS         NS           genue Halogens         NS         NS         NS           ese         120         NS         NS           m         NS         NS         NS           m         NS         NS         NS           y         750.00         NS         NS         NS           s         NS         NS         NS         NS   | Fotal Dissolved Solids   | 2700.00 |       | 4200.00    | Ц            | 3450 00        | Ц     |         | \$00.00 |       |
| Paramic Carbon   NS   NS   NS   NS   NS   NS   NS   N  | hilfate  |         | NS    |            | NS           |                | SN    |         | 250 00  |       |
| publicate)         NS         NS         NS           panie Halogeits         NS         NS         NS           ann         120         NS         180         NS           n         NS         NS         NS         NS           n         NS         NS         NS         NS           n         750.00         NS         NS         NS           n         NS         NS         NS           n         NS         NS         NS           n         NS         NS         NS  | Total Organic Carbon   |         | NS    |            | NS           |                | NS    |         |         |       |
| tuin         NS         NS         NS           se         120         NS         NS         NS           n         NS         NS         NS         NS           n         NS         NS         NS         NS           r         750.00         NS         NS         NS           r         NS         NS         NS   | FOC (Duplicate)  |         | NS    |            | NS           |                | NS    |         |         |       |
| 120  | Total Organic Halogens   |         | NS    |            | NS           |                | NS    |         |         |       |
| 120  | Magnesiun  |         | NS    |            | NS           |                | NS    |         |         |       |
| NS   | Mangenese  | 1 20    |       | 1.50       |              | 1.80           |       |         | 0.05    |       |
| NS   | otassium   |         | NS    |            | SS           |                | SN    |         |         |       |
| 750.00 1200.00 1500.00 1050.00 1050.00 NS  | odnun  |         | NS    |            | _            |                | 4     | 160.00  |         |       |
| NS N   | Alkalinity   | 750.00  |       | 1200:00    | 4            | 1050.00        | 4     |         |         |       |
| SN SN  | Calcium  |         | NS    |            | SZ           |                | SN    |         |         |       |
|  | Tardness   |         | Z Z   |            | SN S         |                | SZ S  |         |         | 1     |
| San State of the s   | Servill  | 000000  | SZ.   | 000000     |              |                | 4     |         |         | 0.63  |
| 73000.00   |  | 22.000  |       | TI THE T I |              | 11 (11 ) (11 ) |       |         |         |       |

NB - Not Sampled
ND - Not Detected
ND - Not Detected
Det Limit - Sampling Detection Limit
MCL - Maximum Contaminant Level; Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards
Guidante Cententrations. Not Enforceable Standards

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Table A.3: Characteristics of the Blydenburg Cleanfill Landfill of New York.

LANDFILL:

Blydenburg Cleanfill Landfill, New York.

OWNER/OPERATOR:

Town of Islip

Resource Recovery Agency

40 Nassau Avenue Islip, New York 11751

LITERATURE SOURCE:

New York State Department of Environmental Conservation

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 1.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris. Known as "Clean Fill".

ACREAGE:

12 acres.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Yes.

LEACHATE SYSTEM:

Yes.

LEACHATE SAMPLE:

Leachate sample taken from leachate collection system.

MISCELLANEOUS:

None.

Table A.4: Sampling for the Blydenburg Cleanfill of New York

| No. of the control  | N N   | NDVIS   |       |       |      | H C      | MCL    |          |
|--|-------|---------|-------|-------|------|----------|--------|----------|
| Mailed   |       | -       | Ìn.   | NDVNS |      | Vân.     | Г      | l/an     |
| The control of the  | -     | NS      |       | SN    |      |          | T      | 700.00   |
| Mailed   |       | NS      | L     | NS    |      |          |        | 4200.00  |
| NS   |       | NS      |       | SN    |      |          |        | 700.00   |
| NS   |       | NS      |       | NS    |      |          |        | 2.70     |
| NS   |       | NS      |       | NS    |      |          |        | 100.00   |
| NS   |       | NS      |       | NS    |      | 3.00     |        |          |
| NS   |       | NS      |       | NS    |      |          |        | 2.00     |
| NS   |       | NS      |       | NS    |      |          | 700.00 |          |
| NS   |       | NS      |       | NS    |      |          |        | 4200.00  |
| Coloride   NS  |       | NS      |       | NS    |      |          |        |          |
| Mail   |       | NS      |       | NS    |      | 5.00     |        |          |
| Proceedinate   NS   NS   NS   NS   NS   NS   NS   N  |       | NS      |       | NS    |      | 1000.00  |        |          |
| Color   Colo |       | NS      |       | SN    |      | 200.00   |        |          |
| Total)   NS  |       | NS      |       | NS    |      | 3.00     |        |          |
| Total)   NS  |       | NS      |       | SZ    |      |          |        | 2100.00  |
| Interestation  |       | NS      |       | SN    |      | 10000.00 |        |          |
| Interest   |       |         |       |       |      |          |        |          |
| NS   | 1/311 | ND/NS   | /dn   | ND/NS |      | Van      | (An    | /ân      |
| NS   | H     | NS      |       | NS    |      |          |        | 20.00    |
| Acid         NS         NS           Acid         NS         NS           Aut/philalate         NS         NS           Aut/philalate         NS         NS           Interest         NS         NS  |       | NS      |       | SN    |      |          |        | 700.00   |
| Acid         NS         NS           Villexylyphthialate         NS         NS           Litylphiemol         NS         NS           Litylphiemol         NS         NS           Litylphiemol         NS         NS           Lene         NS         NS           Includes         NS         NS           Incl  |       | NS      |       | SN    |      | 1.00     |        |          |
| Publication   NS   |       | NS      |       | SN    |      |          |        | 28000.00 |
| Publication   NS   |       | NS.     |       | NS    |      |          |        |          |
| Publication  |       | NS      |       | NS    |      |          |        | 400.00   |
| Phithalate   NS  |       | NS      |       | SN    |      |          |        | 700.00   |
| NS   NS   NS   NS  |       | NS      |       | SZ    |      |          |        | 5600.00  |
| Paragraphic  |       | NS      |       | SN    |      |          |        | 280.00   |
| NS   NS   NS   NS  |       | NS      |       | SX    |      |          |        | 6.80     |
| NS   |       | NS      |       | NS    |      |          |        | 35.00    |
| NS   |       | NS      |       | NS    |      |          |        | 350.00   |
| NS   |       | NS      |       | NS    |      |          |        | 10.00    |
| NS   NS   NS   NS  |       | N.S.    |       | SZ    |      |          |        | 10.00    |
| Horasticides   |       | NS      |       | NS    |      |          |        | 210.00   |
| No.   No.  |       |         |       |       |      |          |        |          |
| HC   | 1/2.  | ND/NS   | l/dn  | ND/NS |      | ng/l     | ug/l   | ng/l     |
| NS   | ┝     | NS      |       | SN    |      |          |        | 0.05     |
| NS   |       | NS      |       | NS    |      | 2.00     |        |          |
| NS   |       | NS      |       | NS    |      |          |        | 0.10     |
| NS   |       | NS      |       | NS    |      |          |        | 5.00     |
| NS   |       | NS      |       | NS    |      |          |        | 0.50     |
| NS   |       | NS      |       | NS    |      |          |        | 70.00    |
| NS   |       | NS      |       | NS    |      | 70.00    |        |          |
| NS   |       | NS      |       | NS    |      |          |        |          |
| NS   |       | NS      |       | NS    |      |          |        |          |
| rate         ug/n         ND/NS         ug/n         ND/NS           NS         NS         NS         NS           NS         NS         NS         NS           ND         1,00         2050.00         NS           NS         NS         NS         NS           2.00         NS         NS         NS           NS         NS         NS         NS  |       |         |       |       |      |          |        |          |
| NS N   | /an   | ND/NS   | L/an  | ND/NS |      | νân      | l/an   | /an      |
| NS N   |       | NS      |       | NS    |      | 90.90    |        |          |
| NS 1.00 2050.00 NS   |       | NS      |       | SZ    |      | 20.00    |        |          |
| NS N   |       | +       |       | NS    |      | 2000.00  |        |          |
| NS N   |       | ND 1.00 |       | Ð     | 1.00 | 2.00     |        |          |
| 2 00 669 00 NS   |       | NS      | _     | NS    |      | 100.00   |        |          |
| 2.00 NS 669.00 NS  |       | NS      |       | NS    |      | 1000.00  |        |          |
| NS NS  | 25.00 |         | 11.00 |       |      | 15.00    |        |          |
| NS NS  |       | NS      |       | NS    |      | 2.00     |        |          |
|  |       | NS      |       | NS    |      | 100.00   |        |          |
|  |       | NS      | 4     | NS    |      | 20.00    |        |          |
| NS   |       | NS      | +     | SN S  |      | 8        | 100:00 |          |
| EN NS  | 1     | SN      | +     | SZ SZ |      | 2.00     |        | 40.00    |
|  | 1     | SN      |       | SS    |      | $\prod$  |        | 37.55    |

| Dieldrin  |         | SN    |      |         | NS    |       |         | NS    |       |         | SN    |      |         |         | 0.10  |
|---|---------|-------|------|---------|-------|-------|---------|-------|-------|---------|-------|------|---------|---------|-------|
| Dunethoate                                      |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      |         |         | 8.00  |
| Disulfoton                                      |         | NS    |      |         | NS    |       |         | NS    |       |         | SN    |      |         |         | 0.50  |
| 2,4,5-T   |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      |         |         | 70.00 |
| 2,4-D   |         | NS    |      |         | SZ    |       |         | SN    |       |         | NS    |      | 70.00   |         |       |
| HxCDD   |         | NS    |      |         | NS    |       |         | SS    |       |         | NS    |      |         |         |       |
| HxCDF   |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      |         |         |       |
|   |         |       |      |         |       |       |         |       |       |         |       |      |         |         |       |
| Heavy Metais                                    | l∕an    | ND/NS |      | √2n     | ND/NS |       | l/da    | ND/NS |       | l/da    | NDVNS |      | 50.     | /ân     | /An   |
| Antimony  |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      | 90.9    |         |       |
| Amenic  |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      | \$0.00  |         |       |
| Barium  |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      | 2000.00 |         |       |
| Cadmium   |         | ND    | 1.00 | 2050.00 |       |       |         | Ω     | 1.00  |         | QN    | 1.00 | 2.00    |         |       |
| Cluomium  |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      | 100.00  |         |       |
| Copper  |         | NS    |      |         | NS    |       |         | NS    |       |         | SN    |      | 1000.00 |         |       |
| Lead  | 2.00    |       |      | 00 699  |       |       | 25.00   |       |       | 11.00   |       |      | 15.00   |         |       |
| Mercury   |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      | 2.00    |         |       |
| Nickel  |         | NS    |      |         | NS    |       |         | SN    |       |         | NS    |      | 100.00  |         |       |
| Selenum ·                                       |         | SS    |      |         | SN    |       |         | NS    |       |         | NS    |      | 50.00   |         |       |
| Silver  |         | SS    |      |         | NS    |       |         | NS    |       |         | NS    |      |         | 100.00  |       |
| Thalburn  |         | SZ S  |      |         | SZ S  |       |         | SS    |       |         | SZ    |      | 2.00    |         |       |
| V aniadillin                                    |         | SZ S  |      |         | Z Z   |       |         | SZ.   |       |         | NS    |      |         |         | 49.00 |
| Zuc   |         | Z.    |      |         | SS    | 90.00 |         | NS    | 10:00 | 10.00   | SN    |      |         | 2000.00 |       |
| Conventional Parameters                         | l/am    | ND/NS |      | Ngm     | ND/NS |       | 1/du    | ND/NS |       | l/gm    | ND/NS |      | 1/2m    | l/gm    | l/am  |
| Biological Oxygen Demand                        |         | NS    |      |         | NS    |       |         | SN    |       |         | NS    |      |         |         |       |
| Chemical Oxygen Demand                          | 78.50   |       |      | 202.40  |       |       | 200.00  |       |       | 508.00  |       |      |         |         |       |
| Chlorides                                       | 100.00  |       |      | 143.00  |       |       | 77.50   |       |       | 1150.00 |       |      |         | 250.00  |       |
| Cyanide   |         | NS    |      |         | NS    |       |         | NS    |       |         | SN    |      | 0.20    |         |       |
| Ammonia, Nitrogen                               | 0.12    |       |      | 1.17    |       |       | 1.17    |       |       | 10.60   |       |      |         |         |       |
| Organic Nitrogen                                |         | NS    |      |         | SS    |       |         | NS    |       |         | NS    |      |         |         |       |
| Nitrate   | 0.13    |       |      |         | Q.    | 0.01  |         | Q     | 0.01  | 0.50    |       |      | 10.00   |         |       |
| Nitrite   |         | SN    |      |         | SN    |       |         | NS    |       |         | NS    |      | 8       |         |       |
| Oil and Greate                                  | 0.12    | DIA.  |      | 93.40   | 914   |       | 17.52   | 014   |       | 1.49    |       |      |         | 0.30    |       |
| Hu  | 90.4    | 2     |      | 999     | S     |       | 00.5    | Z.    |       | 8       | SZ    |      |         | ,,,,,   |       |
| Phenols (Total)                                 | 0 0     |       |      | 0.30    |       |       | 0.20    |       |       | 0.80    | CZ    | 100  |         | 0.3-8.3 |       |
| Phosphorus                                      |         | NS    |      |         | NS    |       |         | NS.   |       |         | SNS   | 0.0  |         |         |       |
| Total Suspended Solids                          |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      |         |         |       |
| Total Dissolved Solids                          | 702.00  |       |      | 1428.00 |       |       | 1110.00 |       |       | 2040.00 |       |      |         | 800.00  |       |
| Sulfate   | 211.00  |       |      | 225.00  |       |       | 310.00  |       |       | 11.70   |       |      |         | 250.00  |       |
| Total Organic Carbon                            |         | Q     | 1.00 | 82.00   |       |       | 105.00  |       |       | 19.00   |       |      |         |         |       |
| TOC (Duplicate)                                 |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      |         |         |       |
| Total Organic Halogens                          |         | NS    |      |         | NS    |       |         | NS    |       |         | NS    |      |         |         |       |
| Magnesium                                       | 1 92    |       |      | 5.29    |       |       | 40.23   |       |       | 122.00  |       |      |         |         |       |
| Mangenese                                       | 7.61    |       |      | 258.00  |       |       | 21.99   |       |       | 17.90   |       |      |         | 0.05    |       |
| Potassium                                       | 0.24    |       |      | 17.60   | 1     |       | 77.93   |       |       | 112.00  |       |      |         |         |       |
| Sodnun  | 25.70   |       |      | 100.00  |       |       | 49.20   |       |       | 233.00  |       |      | 160.00  |         |       |
| Alkalinity                                      | 300.00  |       |      | 00.699  |       |       | 548.00  |       |       | 1480.00 |       |      |         |         |       |
| Calcium   |         | Q     | 0.03 | 136.00  |       |       | 124.00  |       |       | 96.40   |       |      |         |         |       |
| Hardness  | 340.00  |       |      | 840.00  |       |       |         | SS    |       | 2420.00 |       |      |         |         |       |
| Boron C. A. | 00,00   | 2     |      |         | SZ    |       |         | SN    |       |         | SN    |      |         |         | 0.63  |
| opecine centaucanice (untilwein)                | 1000.00 |       |      | 2010.00 |       | 1     | 1000.00 |       |       | 1600.00 |       |      |         |         |       |

NS - Not Sampled
ND - Not Detected
Det Linnin Sampling Detection Limit
MCL - Maximum Contaminant Level; Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards
(Unidance Consentrations - Not Buforceable Standards)

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Table A.5: Characteristics of the Construction Disposal Inc. Landfill of Colorado.

LANDFILL: Construction Disposal, Inc. (CDI) landfill, Adams County,

Colorado.

OWNER/OPERATOR: Construction Disposal Incorporated

9450 Monaco Street

Henderson, Colorado 80640

LITERATURE SOURCE: Hazardous Materials and Waste Management Division

Colorado Department of Health

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 1.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE: Demolition debris and landclearing debris.

ACREAGE: Unknown.

YEARS IN SERVICE: Unknown.

LINER SYSTEM: Unknown.

LEACHATE SYSTEM: Unknown.

LEACHATE SAMPLE: Leachate sample taken from spring water discharge culvert.

MISCELLANEOUS: None.

# Table A.6: Sampling for the Construction Disposal Inc. Landfill of Colorado.

|                            | 2            | Result Det | Det Limit MCL | MCI.     | Conc     |
|----------------------------|--------------|------------|---------------|----------|----------|
| Volatiles                  | Ìn           | D/NS       | ┺             | $\vdash$ | San<br>a |
| Acetone                    |              | SN         |               |          | 700.00   |
| -Butanone                  |              | NS         |               |          | 4200.00  |
| Carbon Disulfide           |              | NS         |               |          | 700.00   |
| Chloromethane              |              | NS         |               |          | 2.70     |
| ,1-Dichloroethane          |              | NS         |               |          | 700.00   |
| 1,2-Dichloroethane         |              | NS         | 3.00          |          |          |
| 4-Dioxane                  |              | NS         |               |          | 5.00     |
| Sthylbenzene               |              | NS         |               | 700.00   |          |
| Methyl Ethyl Ketone (MEK)  |              | NS         |               |          | 4200.00  |
| 4-Methyl-2-Pentanone       |              | NS         |               |          | _        |
| Methylene Chloride         |              | NS         | 5.00          |          |          |
| Toluene                    |              | NS         | 1000.00       | 2        |          |
| 1.1 Trichloroethane        |              | NS         | 200.00        | 0        |          |
| Inchloroethylene           |              | NS         | 3.00          |          |          |
| richlorofluoromethane      |              | SN         |               |          | 2100.00  |
| Xvlenes (Total)            |              | SN         | 1000000       | 8        |          |
|                            |              |            |               |          |          |
| Semi-Volatiles             | Van          | SN/QN      | /#11          | Van      | Ven      |
| Acaronhilana               | }            | NIC        | 1             | +        | 2        |
| cenapitalene               |              | CVI<br>STA |               | 1        | 200.00   |
| Accopiations               | 1            | CNI        |               |          | 3.3      |
| Senzene                    |              | S          | 3.1           |          |          |
| Senzoic Acid               |              | SS         |               |          | 28000.00 |
| 3is(2-Ethylhexyl)phthalate |              | NS         |               |          |          |
| 2,4-Dimethylphenol         |              | NS         |               |          | 400.00   |
| Oi-n-Butyl phthalate       |              | NS         |               |          | 700.00   |
| Diethyl Phthalate          |              | SN         |               |          | 2600 00  |
| Fluoranthene               |              | SN         |               |          | 280.00   |
| Vanthalene                 |              | υN         |               |          | 6 80     |
| m&n-Creosol                |              | SIN        |               |          | 200      |
| Craceof                    |              | NIG        |               |          | 350      |
| 100000                     |              | C. S.      |               |          | 3000     |
| Prenaurene                 |              | SZ S       |               |          | 0001     |
| Phenoi                     |              | SZ         |               |          | 10.00    |
| Pyrene                     |              | NS         | 1             |          | 210.00   |
|                            |              |            |               |          |          |
| Herbicides/Pesticides      | Ìn           | ND/NS      | √a'n          | Ìn       | /ån      |
| Alpha-BHC                  |              | NS         |               |          | 0.05     |
| Endrin                     |              | NS         | 2.00          |          |          |
| Dieldrin                   |              | NS         |               |          | 01.0     |
| Dimethoate                 |              | SN         |               |          | 2.00     |
| Distilfoton                |              | 22         |               |          | 05.0     |
| ACT                        |              | NIG.       |               |          | 200      |
| 4,7-1                      |              | 2014       | 200           |          | 37       |
| 4,+D                       |              | CN1        | 5.0           |          |          |
| HXCDD                      |              | SZ         |               |          |          |
| HxCDF                      |              | NS         |               |          |          |
|                            |              |            |               |          |          |
| Heavy Metals               | ng/l         | ND/NS      | /an           | Ìn       | 1/3n     |
| Antimony                   |              | NS         | 9             | L        |          |
| Arsenic                    |              | SN         | 20.08         |          |          |
| Barium                     |              | NG         | 2000000       |          | _        |
|                            |              | 914        | 200           |          | -        |
| admium                     | $\downarrow$ | 2          | M.C.          |          |          |
| Chromium                   |              | NS         | 100:00        | 0        |          |
| Copper                     |              | NS         | 1000.00       | 8        |          |
| read                       |              | NS         | 15.00         | 0        |          |
| Mercury                    |              | NS         | 2.00          |          |          |
| Nickel                     |              | SN         | 100.00        | 0        | L        |
|                            |              |            |               |          |          |
| Selenium                   |              | NS         | 8008          | -        | ļ        |

|                          |        |       |      |         |         | 5     |
|--------------------------|--------|-------|------|---------|---------|-------|
| 2,4,5-T                  |        | NS    |      |         |         | 00.07 |
| 2,4-D                    |        | NS    |      | 20.00   |         |       |
| HxCDD                    |        | SS    |      |         |         |       |
| HxCDF                    |        | NS    |      |         |         |       |
|                          |        |       |      |         |         |       |
| Heavy Metals             | ng∕l   | ND/NS |      | /ån     | l∕3n    | /An   |
| Antimony                 |        | NS    |      | 9.00    |         |       |
| Arsenic                  |        | NS    |      | 20.00   |         |       |
| Barium                   |        | NS    |      | 2000.00 |         |       |
| Cadmium                  |        | SN    |      | 9:00    |         |       |
| Chromium                 |        | NS    |      | 100.00  |         |       |
| Copper                   |        | NS    |      | 1000.00 |         |       |
| ead                      |        | NS    |      | 15.00   |         |       |
| Mercury                  |        | NS    |      | 2.00    |         |       |
| Nickel                   |        | NS    |      | 100.00  |         |       |
| Selenium                 |        | NS    |      | \$0.00  |         |       |
| Silver                   |        | SN    |      |         | 100.00  |       |
| Thallium                 |        | SN    |      | 2.00    |         |       |
| Vanadium                 |        | NS    |      |         |         | 49.00 |
| Zinc                     |        | NS    |      |         | 8000.00 |       |
|                          |        | 0.00  |      | ,       | ,       |       |
| Conventional Parameters  | I/Sm   | ND/NS |      | mg/l    | l/âm    | l/am  |
| Biological Oxygen Demand |        | NS    |      |         |         |       |
| Chemical Oxygen Demand   |        | Ð     | 2.00 |         |         |       |
| Chlorides                | 56.70  |       |      |         | 250.00  |       |
| Cyanide                  |        | NS    |      | 0.20    |         |       |
| Ammonia, Nitrogen        |        | NS    |      |         |         |       |
| Organic Nitrogen         |        | NS    |      |         |         |       |
| Vitrate                  |        | SS    |      | 10.00   |         |       |
| Nitrite                  |        | SN    |      | 8.      |         |       |
| ron                      | 0 05   |       |      |         | 0.30    |       |
| Oil and Grease           |        | Ð     | 8    |         |         |       |
| ЬН                       | 7.24   |       |      |         | 6.8-8.5 |       |
| Phenols (Total)          |        | NS    |      |         |         |       |
| Phosphorus               |        | NS    |      |         |         |       |
| Fotal Suspended Solids   |        | g     | 2.00 |         |         |       |
| Fotal Dissolved Solids   |        | NS    |      |         | 200.00  |       |
| Sulfate                  | 118.00 | 3     |      |         | 250.00  |       |
| I otal Organic Carbon    | 1      | S     |      |         |         |       |
| I OC (Duplicate)         |        | S     |      |         |         |       |
| lotal Organic Halogens   | 30     | S     |      |         |         |       |
| Magnesium                | 3.6    |       |      |         | 300     |       |
| Wangenese                | 70.0   |       |      |         | 0.03    |       |
| otassium                 | 4.80   |       |      | 0000    |         |       |
| Sodium                   | 30.40  |       |      | 160:00  |         |       |
| Alkalınıty               | 3      | SS    |      |         |         |       |
| Calcium                  | 00.16  |       |      |         |         |       |
| Hardness                 |        | SN    |      |         |         | 1     |
| Boron                    |        | NS    |      |         |         | 0.63  |
|                          |        |       |      |         |         |       |

Disulfoton

NB - Not Sampled
ND - Not Detected
Det Limit - Sampling Detection Limit
Det Limit - Sampling Detection Limit
Det Limit - Sampling Detection Limit
SMCL - Maximum Consuminant Level; Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards
Guidance Concentrations - Not Enforceable Standards

Table A.7: Characteristics of the Cross Trails Rubble Landfill of Maryland.

LANDFILL:

Cross Trails Rubble Landfill, Maryland.

OWNER/OPERATOR:

Brandywine Enterprises, Inc.

5800 Sheriff Road

Fairmont Heights, Maryland 20743

LITERATURE SOURCE:

C&D Waste Landfills, Leachate Quality Data, Volume 2.

Prepared by Gershman, Brickner & Bratton, Inc. for the National Association of Demolition Contractors.

WASTE TYPE:

Construction waste and demolition debris. Specific composition

characteristics are unknown.

ACREAGE:

Unknown.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Leachate collection system installed.

LEACHATE SAMPLE:

Leachate sampled from leachate collection system.

MISCELLANEOUS:

Maryland Department of the Environment proved the leachate data for this landfill. Although liner system is unknown, at least one liner is probable since a leachate collection system is installed. Amount of leachate produced per month varies between 1,000 and

3000 gallons.

## Table A.8: Sampling for the Cross Trails Rubble Landfill of Maryland.

|   | Re      | Result D | Det Limit | MCL     | MCL    | Cenc     |
|---|---------|----------|-----------|---------|--------|----------|
| Volatiles   | l∕àn    | ND/NS    |           | (∕an    | l∕an   | Vâ≡      |
| Acetone   |         | NS       |           |         |        | 700.00   |
| 2-Butanone  |         | SN       |           |         |        | 4200.00  |
| Carbon Disulfide                                  |         | SZ       |           |         |        | 200 00   |
| Chloromethane                                     |         | CN CN    | 9         |         |        | 2.70     |
| 1. Dichloroethane                                 |         | NIG      | 25.5      |         |        |          |
| 2 Distinction                                     |         | 2 2      | 03.0      | 00.0    |        | 33.00    |
| ,z-Dicinoroculane                                 |         | Z        | 0.50      | 3.00    |        |          |
| 1,4-Lhoxane                                       |         | SS       |           |         |        | 200      |
| Ethylbenzene                                      |         | ND       | 0.50      |         | 700.00 |          |
| Methyl Ethyl Ketone (MEK)                         |         | NS       |           |         |        | 4200.00  |
| 4-Methyl-2-Pentanone                              |         | SN       |           |         |        |          |
| Methylene Chloride                                |         | ND       | 0.50      | 5.00    |        |          |
| Toluene   |         | ND       | 0.50      | 1000.00 |        |          |
| 1.1 Trichloroethane                               |         | SZ.      |           | 200 00  |        |          |
| ichlosoathulana                                   |         | P.C      |           |         |        |          |
| Tritle 6.   |         | CNI.     | 0,0       | 3       |        | 3        |
| Heiner chine chile dialie                         |         | ON.      | 0.30      |         |        | 7100.00  |
| Aylelles (10tal)                                  |         | S        |           | 00.0001 |        |          |
|   |         |          |           | ľ       |        |          |
| Semi-Volumes                                      | n/An    | SNIGS    |           | i de    | ng.    | ā        |
| Acenaphthene                                      |         | NS       |           |         |        | 20.00    |
| Acetophenone                                      |         | NS       |           |         |        | 700.00   |
| Вепzене   | 080     |          | 0.50      | 1.00    |        |          |
| Benzoic Acid                                      |         | NS       |           |         |        | 28000.00 |
| Bis(2-Ethylhexyl)phthalate                        |         | NS       |           |         |        |          |
| 2 4-Dimethylphenol                                |         | NZ.      |           |         |        | 400.00   |
| Di-n-Butyl oblivalate                             |         | 2        |           |         |        | 700.00   |
| District Dishalata                                |         | NIG.     |           |         |        | 3000     |
| Straight manager                                  |         | CZ.      |           |         |        | ON ONE   |
| and an and an |         | Z.       |           |         |        | 780.00   |
| Vapulatelle                                       |         | Z.       |           |         |        | 080      |
| mæp-creosoi                                       |         | SZ       |           |         |        | 32.00    |
| o-Creosol   |         | SS       |           |         |        | 320.00   |
| rhenauurene                                       |         | Z        |           |         |        | 800      |
| raenoi  |         | S        |           |         |        | 10.00    |
| Pyrene  |         | NS       |           |         |        | 210.00   |
|   |         |          |           |         |        |          |
| Herbicides/Pesticides                             | ug/l    | ND/NS    |           | l/ån    | Én     | San      |
| Alpha-BHC   |         | NS       |           |         |        | 0.05     |
| Endrin  |         | NS       |           | 2.00    |        |          |
| Dieldrin  |         | NS       |           |         |        | 0.10     |
| Directhoate                                       |         | SN       |           |         |        | 8        |
| Disulfoton  |         | 2        |           |         |        | 50       |
| 7.4.6.T   |         | 2        |           |         |        | 00.00    |
| 4,5-1   |         | S. S.    |           | 20 00   |        | 30.0/    |
| 2,4+D   |         | Z        |           | 70.00   |        |          |
| HxCDD   |         | SN       |           |         |        |          |
| HxCDF   |         | NS       |           |         |        |          |
|   |         |          |           |         |        |          |
| APRIL 1992 SAMPLING:                              |         |          |           |         |        |          |
| Heavy Metals                                      | l/gu    | ND/NS    |           | l/dn    | l/an   | 120      |
| Antinony  |         | CZ       | 300.00    | \$0.00  |        |          |
| Arsenic   | × 00    |          | \$ 00     | 2000 00 |        |          |
| Barium  | 1000 00 |          | NA        | \$ O    |        |          |
|   | 20000   | 1        | 20.00     | 200     |        |          |
| Reference   |         | Q.       | 20.00     | 00.00   |        |          |
| Calculatin  |         | Q.       | 00.00     | 00.000  |        |          |
| Copper  |         | 2        | 30.00     | 2000    |        |          |
| read  |         | Q.       | 200.00    | 2.00    |        |          |
| Mercury   |         | Q        | 0.50      | 100.00  |        |          |
| Nickel  |         | QN       | 00.09     | 20.00   |        |          |
| lenium  |         | ND       | 5.00      |         | 100.00 |          |
| Silver  |         | QN       | 5.00      | 2.00    |        |          |
| Thalliam  |         |          |           |         |        |          |
|   |         | Q        | 400.00    |         |        | 49 00    |

| Distilleten              |         | 200   |        |         |          | 0.00  |
|--------------------------|---------|-------|--------|---------|----------|-------|
| 2,4,5-T                  |         | SN    |        |         |          | 70.00 |
| 2,4 <b>-</b> D           |         | SN    |        | 70.00   |          |       |
| HxCDD                    |         | SN    |        |         |          |       |
| HxCDF                    |         | SN    |        |         |          |       |
|                          |         |       |        |         |          |       |
| APRIL 1992 SAMPLING:     |         |       |        |         |          |       |
| Heavy Metals             | Ván     | ND/NS |        | /Za     | /Jan     | /dn   |
| Antúnony                 |         | Ω     | 300.00 | 20.00   |          |       |
| Arsenic                  | 8.00    |       | 2.00   | 2000.00 |          |       |
| Ватіит                   | 1000.00 |       | ¥      | 2.00    |          |       |
| Cadınium                 |         | QN    | 20.00  | 100.00  |          |       |
| Chromium                 |         | QN    | 60.00  | 1000.00 |          |       |
| Copper                   |         | QN    | 30.00  | 15.00   |          |       |
| Lead                     |         | ΩN    | 200.00 | 2.00    |          |       |
| Mercury                  |         | QN    | 0.50   | 100.00  |          |       |
| Nickel                   |         | ON    | 00:09  | 80.00   |          |       |
| Selenium                 |         | ND    | 5.00   |         | 100.00   |       |
| Silver                   |         | QN    | \$.00  | 2.00    |          |       |
| Thallium                 |         | N     | 400.00 |         |          | 49.00 |
| Vanadium                 |         | NS    |        |         | \$000.00 |       |
| Zinc                     | 84 00   |       | 8.00   |         |          |       |
|                          |         |       |        |         |          |       |
| Conventional Parameters  | mg/l    | ND/NS |        | l/gm    | ∫/dm     | l/du  |
| Biological Oxygen Demand | 11.00   |       | 1.00   |         |          |       |
| Chemical Oxygen Demand   | 180.00  |       | 10.00  |         | 250.00   |       |
| Clubrides                | 100.00  |       | 1.00   | 0.20    |          |       |
| Cyanide                  |         | SS    |        |         |          |       |
| Anunonia, Nitrogen       | 1.40    |       | 1.00   |         |          |       |
| Organic Nitrogen         |         | NS    |        | 10.00   |          |       |
| Nitrate                  |         | Q     |        | 1.00    |          |       |
| Nitrite                  |         | Ω     |        |         | 0.30     |       |
| Iron                     | 46.00   |       | 1.00   |         |          |       |
| Oil and Grease           |         | NS    |        |         | 6.5-8.5  |       |
| pH                       | 6.46    |       |        |         |          |       |
| Phenols (Total)          |         | NS    |        |         |          |       |
| Phosphorus               | 0.82    |       | 0.15   |         |          |       |
| Total Suspended Solids   |         | NS    |        |         | \$00.00  |       |
| Total Dissolved Solids   | 1606.00 |       |        |         | 250.00   |       |
| Sulfate                  | 380.00  |       | \$.00  |         |          |       |
| Total Organic Carbon     |         | N3    |        |         |          |       |
| TOC (Duplicate)          |         | NS    |        |         |          |       |
| Total Organic Halogens   |         | NS    |        |         |          |       |
| Magnesium                | 120.00  |       | 8.00   |         | 0.05     |       |
| Mangenese                | 2.20    |       | 0.04   |         |          |       |
| Potassinn                | 42.00   |       | 3.00   | 160.00  |          |       |
| Sodiun                   | 100.00  |       | 4.00   |         |          |       |
| Alkalinity               | 1800.00 |       | 1.00   |         |          |       |
| Calcium                  | 480.00  |       | 80.00  |         |          |       |
| Hardness                 | 2114.00 |       |        |         |          | 0.63  |
| Вогоп                    |         | NS    |        |         |          |       |
|                          |         |       |        |         |          |       |

NS - Not Sampled
ND - Not Detected
Det Limit - Sampling Detection Limit
MCL - Maximum Contaminant Level; Enforceable Groundwater Standards
MCL - Accounts y Medicinant Contaminant Level; Enforceable Groundwater Standards
McCl - Accounts y Medicinant Contaminant Level; Enforceable Groundwater County and Continued Con

Table A.9: Characteristics of the D&M Site of Connecticut.

LANDFILL:

D&M Site, Connecticut.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

Construction and Demolition Waste Landfills.

Prepared by ICF Incorporated for

the U.S. Environmental Protection Agency, Office of Solid Waste.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

Unknown.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Unknown.

MISCELLANEOUS:

Table A.10: Sampling for the D and M Landfill of Connecticut.

|                            | Result |        |   |      | UESAII |          |        |          |
|----------------------------|--------|--------|---|------|--------|----------|--------|----------|
| /olatiles                  | /An    | ND/NS  |   | ηď   | ND/NS  | √3n      | Ìn     | √3n      |
| Acetone                    |        | SN     |   |      | NS     |          |        | 700.00   |
| 2-Butanone                 |        | NS     |   |      | NS     |          |        | 4200.00  |
| Parhon Dieulfide           |        | v.Z    |   |      | s'Z    |          |        | 200 00   |
| (4) Carolina Mariante      |        | 1014   |   |      | NIG    |          |        | 270      |
| or contentante             |        | 2 5    |   |      | 2      |          |        | 00.000   |
| 1-Diction regulare         |        | CV.    |   |      | CN     |          |        | 3        |
| , z-Dichloroethane         |        | SZ     |   |      | ŝ      | 3.00     |        |          |
| ,4-Dioxane                 |        | NS     |   |      | NS     |          |        | 2.00     |
| Ethylbenzene               |        | SZ     |   |      | SZ     |          | 700.00 |          |
| Mathyl Edyd Vetone (MEV)   |        | NG     |   |      | 57     |          |        | 420000   |
| and the second control of  |        |        |   |      |        |          |        |          |
| detnyl-2-Pentanone         |        | SZ.    |   |      | 2      |          |        |          |
| Methylene Chloride         |        | SZ     |   |      | SZ     | 2.00     |        |          |
| Toluene                    |        | SN     |   |      | SN     | 1000.00  |        |          |
| 1 1 Trichland of con-      |        | 210    |   |      | NIC    | 2000     |        |          |
| 1 Highware diale           |        | 2      |   |      |        | 20.00    | -      |          |
| richloroethylene           |        | SN     |   |      | NS     | 3.00     |        |          |
| Trichlorofluoromethane     |        | SN     |   |      | NS     |          |        | 2100.00  |
| Xvlenes (Total)            |        | 87     |   |      | SZ     | 10000 00 |        |          |
| (                          |        |        |   |      |        |          |        |          |
| 1 1 1 1 1 1 1 1 1          | 1      | STOCKE |   | 0    | ONLIN  | 000      | 0-11   |          |
| n-Volania                  | An.    | CNICA  |   | n/An | CNIMA  | 14       | 100    |          |
| Acenaphthene               |        | NS     |   |      | NS     |          |        | 20.00    |
| Acetophenone               |        | 22     |   |      | SZ     |          |        | 700.00   |
|                            |        | 014    |   |      | NIO.   | 8        |        |          |
| Belizene                   |        | cz.    |   |      | 2      | 3        |        |          |
| Benzoic Acid               |        | SZ     |   |      | NS     |          |        | 28000.00 |
| Bis(2-Ethylhexyl)nhthalate |        | SN     |   |      | SN     |          |        |          |
|                            |        | 95,    |   |      | 517    |          |        | 100      |
| 2,4-Duneutypnenot          |        | g      |   |      | S      |          |        | 3.3      |
| n-Butyl phthalate          |        | NS     |   |      | NS     |          |        | 200.00   |
| Diethyl Phthalate          |        | SN     |   |      | NS     |          |        | 5600.00  |
|                            |        | 5      |   |      | NIG    |          |        | 200 000  |
| rinoranurene               |        | S      |   |      | 2      |          |        | 7,000    |
| Napthalene                 |        | NS     |   |      | NS     |          |        | 0.80     |
| in&p-Creesel               |        | SZ     |   |      | SZ     |          |        | 35.00    |
| -Creosol                   | L      | SN     |   |      | SZ     |          |        | 350.00   |
|                            |        | NIO.   |   |      | NIG    |          |        | 10.00    |
| The last cite              |        |        |   |      |        |          |        | 00 01    |
| Phenoi                     |        | 2      |   |      | SS     |          |        | 30.01    |
| Pyrene                     |        | NS     |   |      | NS     |          |        | 210.00   |
|                            |        |        |   |      |        |          |        |          |
| Herhicides/Pesticides      | 100    | SNON   |   | l'en | SN/GN  | Van      | l/an   | l/an     |
| Dictional Spicions         | A      | 2      |   |      | 2      |          | . 4    |          |
| Alpha-BHC                  |        | SN     |   |      | 22     |          |        | 0.03     |
| Endru                      |        | NS     |   |      | NS     | <br>2 00 |        |          |
| Dieldrin                   |        | SN     |   |      | SN     |          |        | 0.10     |
| Jen aftereta               |        | 2      |   |      | 7      |          |        | 90.5     |
| incurrate.                 |        |        |   |      |        |          |        | 3        |
| Disultoton                 |        | 2      |   |      | 2      |          |        | 05.0     |
| 2,4,5-T                    |        | NS     |   |      | SN     |          |        | 70.00    |
| ç                          |        | SZ     |   |      | SN     | 70.00    |        |          |
| 11-000                     |        | MIG    |   |      | No     |          |        |          |
| CDD                        |        | 2      |   |      | 2      |          |        |          |
| HxCDF                      |        | NS     |   |      | S<br>Z |          |        |          |
|                            |        |        |   |      |        |          |        |          |
| Heavy Metals               | l/an   | SN/QN  |   | Van  | SN/QN  | (/an     | l/gn   | /dn      |
|                            |        | NIG    |   |      | ΝG     | 80.9     |        |          |
| -dimensis                  | -      |        |   |      |        | 3        |        |          |
| Arsenic                    |        | 2      |   |      | S      | 20.00    |        |          |
| Bariun                     |        | SZ     |   |      | SZ     | 2000.00  |        |          |
| Cadminm                    |        | SZ     |   |      | SN     | 5.00     |        |          |
|                            |        | NIG    |   |      | No.    | 100 00   |        |          |
| CILCORDINA                 |        | 27.    |   |      | 2      | 3        |        |          |
| Copper                     |        | NS     |   |      | SS     | 1000.00  | -      |          |
| pead                       |        | SN     |   |      | NS     | 15.00    |        |          |
| Mercino                    |        | ď      |   |      | S.Z    | 2 00     |        |          |
| i i                        |        |        |   |      | 2      | 20.00    |        |          |
| Nickel                     |        | 2<br>Z |   |      | 2      | 333      |        |          |
| Selenium                   |        | SZ     |   |      | SX     | 20.00    |        |          |
| Gleen                      |        | NZ.    |   |      | SZ     |          | 100.00 |          |
|                            |        |        |   |      |        |          |        |          |
|                            |        | -      | _ |      | NIG    | 200      |        | _        |
| i ildustrii                |        | NS     |   |      | SZ     | 200      |        |          |

| HXCDF                                     |        | 22       | 1       |           |         |          |       |
|---|--------|----------|---------|-----------|---------|----------|-------|
| 10000                                     | ,      | SNOW     | Corre   | SNON      | Ven     | 1/80     | Ven   |
| neavy melaus                              |        | S. India | -An     | S. Indian |         |          |       |
| Autimony                                  |        | SZ       |         | Z         | 8       |          |       |
| Arsenic                                   |        | NS       |         | NS        | 20.00   |          |       |
| Bariun                                    |        | NS       |         | NS        | 2000.00 |          |       |
| Cadınium                                  |        | NS       |         | NS        | 2.00    |          |       |
| Cluomiun                                  |        | SZ       |         | NS        | 100.00  |          |       |
| Copper                                    |        | SN       |         | NS        | 1000.00 |          |       |
| cead                                      |        | NS       |         | SN        | 15.00   |          |       |
| Mercury                                   |        | NS       |         | NS        | 2.00    |          |       |
| Nickel                                    |        | N3       |         | NS        | 100.00  |          |       |
| Selenium                                  |        | NS       |         | SN        | \$0.00  |          |       |
| Silver                                    |        | NS       |         | NS        |         | 100.00   |       |
| Thattium                                  |        | SN       |         | NS        | 2.00    |          |       |
| Vanadium                                  |        | NS       |         | NS        |         |          | 49.00 |
| Zinc                                      |        | SN       |         | NS        |         | \$000.00 |       |
|   |        |          |         |           |         |          |       |
| Conventional Parameters                   | l⁄am   | ND/NS    | √3 m    | ND/NS     | mg/l    | mg/l     | √am   |
| Biological Oxygen Demand                  |        | NS       |         | NS        |         |          |       |
| Chemical Oxygen Demand                    |        | NS       |         | NS        |         |          |       |
| Chlorides                                 | 17.00  |          | 38.00   |           |         | 250.00   |       |
| Cyanide                                   |        | SN       |         | SN        | 0.20    |          |       |
| Ammonia, Nitrogen                         |        | SN       |         | NS        |         |          |       |
| Organic Nitrogen                          | 1.80   |          |         | NS        |         |          |       |
| Nitrate                                   |        | SN       |         | NS        | 10.00   |          |       |
| Nitrite                                   |        | NS       |         | NS        | 1.00    |          |       |
| non                                       | 0.30   |          | 2.00    | _         |         | 0.30     |       |
| Oil and Grease                            |        | NS       |         | NS        |         |          |       |
| Hd  | 7.20   |          | 8.00    |           |         | 6.5-8.5  |       |
| Plienols (Total)                          |        | NS       |         | NS        |         |          |       |
| Phosphorus                                |        | NS       |         | NS        |         |          |       |
| Fotal Suspended Solids                    | 26.00  |          |         | NS        |         |          |       |
| Total Dissolved Solids                    | 640.00 |          | 2900.00 | 0         |         | \$00.00  |       |
| Sulfate                                   |        | NS       |         | SS        |         | 250.00   |       |
| Total Organic Carbon                      |        | NS       |         | NS        |         |          |       |
| FOC (Duplicate)                           |        | Z        |         | SS        |         |          |       |
| Total Organic Halogens                    |        | SZ       |         | NS        |         |          |       |
| Magnesium                                 |        | SN       |         | NS        |         |          |       |
| Mangenese                                 |        | NS       |         | NS        |         | 0.05     |       |
| Potassium                                 |        | SN       |         | SS        |         |          |       |
| Sodiun                                    |        | NS       |         | NS        | 160.00  |          |       |
| Alkalinity                                | 620.00 |          |         | SS        |         |          |       |
| Calcium                                   |        | NS       |         | NS        |         |          |       |
| Hardness                                  |        | NS       |         | NS        |         |          |       |
| Boron                                     |        | NS       |         | NS        |         |          | 0.63  |
| ( ) - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - |        | SN       |         | 2         | _       |          |       |

NB - Not Sampled
ND - Not Detected
Det Limit - Sampling Detection Limit
MCL - Maximum Contaminant Level: Enforceable Groundwater Standards
MCL - Secondary Maximum Contaminant Level: Enforceable Groundwater Standards
Similar - Secondary Maximum Contaminant Level: Enforceable Groundwater Standards
Sindarce Concentrations - Not Enforceable Standards

Table A.11: Characteristics of the Deep River Bulky Waste Landfill of Connecticut.

LANDFILL:

Deep River Bulky Waste Landfill, Connecticut.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

Bulky Waste Leachate Characterization Survey

Maurice Hamel, Connecticut Department of Environmental

Protection

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 2.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris. Includes scrap metal.

ACREAGE:

4 acres.

YEARS IN SERVICE:

Opened in 1976.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Leachate sample taken from seep at base of fill at edge of wetland.

MISCELLANEOUS:

There is black manganese staining at the seep. Ammonia concentrations are consistently elevated suggesting siting or

operational problems.

Table A.12: Sampling for the Deep River Bulky Waste Landfill of Connecticut.

| Part    |                            | å      | June-1988 | å      | 2 -   | -             | ŏ         | ber-198 | -             | Dec       | aber-19  | _         | ~       | Secondary | Cuidanc  |
|--|----------------------------|--------|-----------|--------|-------|---------------|-----------|---------|---------------|-----------|----------|-----------|---------|-----------|----------|
| No. 1975   No. 1975  | Volatiles                  | 5      | SN/Q      | 9      | _     | L             |           | DANS    |               |           | DVNS     | -         |         | T I       | I/an     |
| Part    | Acetone                    |        | NS        |        | NS.   |               | t         | SZ      |               | t         | 82       |           |         |           | 7000     |
| No. 10.0000000000000000000000000000000000  | 2-Butanone                 |        | NS        |        | SZ    | -             | T         | SZ.     | f             | T         | SZ       |           |         |           | 4200     |
| No. of the continue   No. of the continue  | Carbon Disulfide           |        | 82        |        | 200   |               | T         | D N     | 1             | $\dagger$ | S N      | t         | T       |           | 1007     |
| No. of the control  | Theromethan                |        | 22        |        | SN SN |               |           | PIA DIA | +             | $\dagger$ | 2 2      | $\dagger$ | 1       |           | 3        |
| No. of the control  | 1 1-Dichloroethane         |        | 82        |        | 2 2   |               |           | No.     | +             | $\dagger$ | 2014     | t         | 1       |           | 1000     |
| No. 10.   No.  | 1.2-Dictyloroethane        | L      | SN        |        | SZ    | $\frac{1}{1}$ |           | 2 2     |               |           | 200      | T         | 5       |           | 0.00     |
| Page    | 1,4-Dioxane                |        | NS        |        | SZ    | -             | T         | NS      | +             | t         | SZ       | T         |         |           | \$ 00    |
| Part    | Ethylbenzene               |        | NS        |        | SN    |               |           | SZ      | -             | t         | SN       | T         | Ī       | 200 00    | 8        |
| No. 10, No.  | Methyl Ethyl Ketone (MEK)  |        | NS        |        | NS    |               |           | NS      | -             |           | NS       | İ         | Ī       |           | 4200.00  |
| No. 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,  | 4-Methyl-2-Pentanone       |        | NS        |        | SZ    |               |           | NS      |               |           | NS       |           |         |           |          |
| No. 10, No.  | Methylene Chloride         |        | NS        |        | NS    |               |           | NS.     | _             |           | NS       |           | 8.8     |           |          |
| National Confidence    Toluene                    |        | NS        |        | NS    | _             |           | NS      | -             |           | NS<br>NS |           | 1000.00 |           |          |
| Name   | 1, 1, 1-trichloroethane    |        | NS        |        | NS    |               |           | NS      | -             |           | SN       |           | 200.00  |           |          |
| NS   NS   NS   NS   NS   NS   NS   NS  | Trichloroethylene          |        | NS        |        | NS    |               |           | NS      |               |           | NS       |           | 3.00    |           |          |
| Name   | Trichlorofluoromethane     |        | NS        |        | NS    |               |           | SZ      |               |           | NS       | -         |         |           | 2100.00  |
| Acadesise         up/l         NDAS         up/l   | Xylenes (Total)            |        | NS        |        | NS    |               |           | NS      |               |           | NS       | -         | 00.0000 |           |          |
| Authorization         wg/1         NDNS         wg/1   |                            |        |           |        |       |               |           |         |               |           |          |           |         |           |          |
| Marchele   | Semi-Volatiles             | √an    | ND/NS     | /ån    | ND/NS |               |           | ND/NS   |               | Н         | ND/NS    |           | San     | /an       | /An      |
| Particular   N S   | Acenaphthene               |        | SN        |        | SN    |               | $\vdash$  | NS      |               |           | NS       |           |         |           | 20.00    |
| Condition         NS         NS         NS         NS         100         NS         100         NS         100         NS         100         NS  | Acetophenone               |        | NS        |        | NS    |               |           | NS      |               |           | NS       |           |         |           | 700.0    |
| Published   NS   | Benzene                    |        | NS        |        | NS    |               |           | NS      |               |           | NS       |           | 1.00    |           |          |
| Part    | Benzoic Acid               |        | NS        |        | NS    |               |           | NS      |               |           | NS       |           |         |           | 28000.00 |
| NS   NS   NS   NS   NS   NS   NS   NS  | Bis(2-Ethylhexyl)phthalate |        | NS        |        | NS    |               |           | NS<br>S |               |           | NS       |           |         |           |          |
| Purple black   NS  | 2,4-Dimethylphenol         |        | NS        |        | SS    | -             | 1         | NS      |               | 1         | SN       | 1         |         |           | 400.0    |
| No.    Ji-n-Butyl phthalate       |        | SN        |        | SN    | +             | 1         | SN      | +             | +         | SN       | 1         |         |           | 700.0    |
| Particular   Na  | Dieutyl Phulalate          |        | SZ SZ     |        | S S   | +             | 1         | NS.     | +             | 1         | SN       | 1         |         |           | \$600.0  |
| No.    Vanitations                |        | Ne o      |        | C S   | +             | T         | No.     | +             |           | 2 2      | $\dagger$ |         |           | 780.0    |
| NS   NS   NS   NS   NS   NS   NS   NS  | n&p-Crepsol                |        | SZ SZ     |        | S S   | +             |           | SN SN   | +             |           | SN SN    | +         | T       |           | 35.00    |
| National    -Creosol                   |        | SN        |        | s Z   |               |           | SZ      | $\frac{1}{1}$ | l         | SZ.      | T         | T       |           | 350.00   |
| NS   NS   NS   NS   NS   NS   NS   NS  | henathrene                 |        | SN        |        | NS    |               |           | NS      |               |           | SN       |           |         |           | 10.00    |
| Handeline   Hand | Phenol                     |        | NS        |        | NS    |               |           | NS      |               |           | NS       |           |         |           | 10.00    |
| Name   | Рутепе                     |        | NS        |        | NS    |               |           | NS      | +             |           | NS       |           |         |           | 210.00   |
| Name   | 9                          |        | Side Gia  |        | 3.0   | +             | +         |         | +             | +         |          | 1         | 1       |           | ľ        |
| NS   NS   NS   NS   NS   NS   NS   NS  | Herbicides/Pesticides      | ng/l   | ND/NS     | /dn    | ND/NS |               | +         | ND/NS   | +             | +         | ND/NS    | +         | l/an    | ng/       | /an      |
| Na   | Alpha-BHC                  |        | NN NN     |        | N S   | +             | †         | SN      | $\dagger$     | 1         | SN       |           | 100     |           | 0.03     |
| total         NS  | Dieldrin                   |        | Ne        |        | S S   |               |           | S S     | $\dagger$     |           | C V      |           | 37      |           | 01.0     |
| Na   | Dimethoate                 |        | S.V.      |        | S S N | +             | T         | S N     | $\dagger$     | t         | 2 2      | $\dagger$ |         |           | 2 2      |
| NS   NS   NS   NS   NS   NS   NS   NS  | Disulfoton                 |        | NS        |        | NS    |               |           | SN      | +             | T         | SX       |           | T       |           | 0.50     |
| NS   NS   NS   NS   NS   NS   NS   NS  | 2,4,5-T                    |        | NS        |        | NS    |               |           | NS      |               |           | SN       |           |         |           | 70.00    |
| NS   NS   NS   NS   NS   NS   NS   NS  | 2,4-D                      |        | NS        |        | NS    |               |           | NS      | +             | _         | NS       |           | 70.00   |           |          |
| Matchelle   MS   | HxCDD                      |        | NS        |        | NS    |               |           | NS      | 1             |           | SS       |           |         |           |          |
| Metals         ug/1         NDNS         ug/1         ug/1         NDNS         ug/1         NDNS         ug/1         NDNS         ug/1         NDNS         ug/1         NDNS         ug/1         NDNS         <  | HXCDF                      |        | NS        |        | NS    | 1             | 1         | NS      | +             |           | NS       | 1         |         |           |          |
| 150   ND   | Heavy Metals               | Von    | SN/QN     | (An    | ND/NS |               | $\dagger$ | SNON    | +             | +         | SNOW     | $\dagger$ | Von     | Ven       | 1011     |
| 150 00   ND   ND   ND   ND   ND   ND   ND  | Antimony                   |        | NS        |        | NS    |               | +         | NZ.     | -             | t         | NS       |           | 90.9    |           | 2        |
| 160 00   | Arsenic                    |        | QN.       |        | QN    | -             |           | QN      | T             |           | SE       |           | 50 00   |           |          |
| tim         ND   | Валип                      | 160.00 |           | 300.00 |       | 20            | 00.00     |         | 7             | 00.00     |          |           | 2000.00 |           |          |
| Hull         ND         N   | Cadmiun                    |        | QN        |        | QN    |               | -         | QN      |               | 00.01     |          |           | 5.00    |           |          |
| 1000    | Chromiun                   |        | QN        |        | ND    |               |           | ND      |               |           | QN       |           | 100.00  |           |          |
| Y         ND         ND </td <td>Copper</td> <td>30.00</td> <td></td> <td>20.00</td> <td></td> <td>=</td> <td>0.00</td> <td></td> <td></td> <td>00.0</td> <td></td> <td>1</td> <td>00 0001</td> <td></td> <td></td>   | Copper                     | 30.00  |           | 20.00  |       | =             | 0.00      |         |               | 00.0      |          | 1         | 00 0001 |           |          |
| NS   | Lead                       | 20:00  |           | 20.00  | !     | ~             | 0.00      | 1       | +             | 20 00     |          | 1         | 2 00    |           |          |
| N  | Mercury                    |        | ON SI     |        | ON S  | +             |           | 2 5     |               |           | ON I     | $\dagger$ | 2 00    |           |          |
| In 10.00 NS  | Selenium                   |        | CZ CZ     |        | S CZ  | +             | +         | CZ CZ   |               | T         | CZ CZ    |           | 20.00   |           |          |
| NS   | Silver                     |        |           |        | Q.    |               |           | QZ      | -             |           | Ω        |           |         | 100 00    |          |
| N SN SN SN Unitip  | Пайип                      |        | SN        |        | SX    |               |           | SN      |               |           | NS       |           | 2.00    |           |          |
|  | Vanadium                   |        | SN        |        | SN    | +             | +         | NS      | +             |           | SZ       | †         | 1       | 0000      | 49.00    |

| HxCDF                          |        | SN    |   |        | SN    |   | T      | C.    |         |       |         |         |       |
|--------------------------------|--------|-------|---|--------|-------|---|--------|-------|---------|-------|---------|---------|-------|
| Horay Metals                   | Van.   | ND/NS | T | Van    | ND/NS | I | 1/20   | ND/NS | Ván     | ND/NS | /ân     | L'an    | ug/J  |
| Antimonia                      |        | SZ.   |   |        | S.Z   |   |        | SN    |         | SN    | 00.9    |         |       |
| Arrenic                        |        | S     |   |        | QN    |   |        | GN    |         | QN    | \$0.00  |         |       |
| Banun                          | 160 00 |       |   | 300.00 |       |   | 200.00 |       | 200 00  |       | 2000 00 |         |       |
| Cadmiun                        |        | S     |   |        | Q     |   |        | DN    | 10.00   |       | 5.00    |         |       |
| Cluomium                       |        | Q.    |   |        | QN    |   |        | QN    |         | ND    | 100.00  |         |       |
| Copper                         | 30.00  |       |   | 20.00  |       |   | 110.00 |       | 40.00   |       | 1000.00 |         |       |
| Lead                           | \$0.00 |       |   | 90.09  |       |   | \$0.00 |       | 70.00   |       | 15.00   |         |       |
| Mercury                        |        | Q     |   |        | QN    |   |        | N     |         | S     | 2.00    |         |       |
| Nickel                         |        | SN    |   |        | NS    |   |        | NS    |         | NS    | 100.00  |         |       |
| Selenium                       |        | QN    |   |        | QN    |   |        | ND    |         | N     | \$0.00  |         |       |
| Silver                         | 10.00  |       |   |        | QN    |   |        | QN    |         | ND    |         | 100.00  |       |
| Thallium                       |        | NS    |   |        | NS    |   |        | NS    |         | NS    | 2.00    |         |       |
| Variadium                      |        | SN    |   |        | NS    |   |        | NS    |         | SZ    |         |         | 49.00 |
| Zinc                           |        | NS    |   |        | NS    |   |        | NS    |         | NS    |         | 2000.00 |       |
|                                |        |       |   |        |       |   |        |       |         |       |         |         |       |
| Conventional Parameters        | /dm    | ND/NS |   | mg/l   | SN/QN |   | l/dm   | ND/NS | mg/l    | ND/NS | /am     | mg/l    | mg/l  |
| Biological Oxygen Demand       | 45.00  |       |   |        | NS    |   | 11 00  |       | 24.00   |       |         |         |       |
| Chemical Oxygen Demand         | 45.00  |       |   | 50.00  |       |   | 30.00  |       | \$8.00  |       |         |         |       |
| Chlorides                      | 23.00  |       |   | 120.00 |       |   | 100.00 |       | 120.00  |       |         | 250.00  |       |
| Cyanide                        |        | QN    |   |        | QN    |   |        | Q.    | 0.34    |       | 0.20    |         |       |
| Amnonia, Nitrogen              | 3.00   |       |   | 3.00   |       |   | 4.80   |       | 4.20    |       |         |         |       |
| Organic Nitrogen               | 2.00   |       |   | 0.70   |       |   |        | Q     | 08.0    |       |         |         |       |
| Nitrate                        |        | ND    |   |        | ΩN    |   |        | QN    |         | Q     | 10.00   |         |       |
| Nitrite                        |        | QN    |   | 0.00   |       |   |        | ΩN    | 00.0    |       | 8       |         |       |
| Iron                           | 36.00  |       |   | 88.00  |       |   | 33.00  |       | 29.00   |       |         | 0.30    |       |
| Oil and Grease                 |        | SN    |   |        | NS    |   |        | NS    |         | NS    |         |         |       |
| Hd                             | 6.70   |       |   | 6.70   |       |   | 09.9   |       | 6.40    |       |         | 6.5-8.5 |       |
| Phenols (Total)                |        | NS    |   |        | SN    |   |        | NS    |         | NS    |         |         |       |
| Phosphorus                     |        | NS    |   |        | NS    |   |        | NS    |         | NS    |         |         |       |
| Total Suspended Solids         | 150.00 |       |   | 150.00 |       |   | 110.00 |       | 100 00  |       |         |         |       |
| Total Dissolved Solids         | 480.00 |       |   | 510.00 |       |   | 200 00 |       | \$50.00 |       |         | 200.00  |       |
| Sulfate                        | 95.00  |       |   | 21.00  |       |   |        | Q.    | \$5.00  |       |         | 250.00  |       |
| Total Organic Carbon           |        | NS    |   |        | NS    |   |        | SS    |         | SZ    |         |         |       |
| TOC (Duplicate)                |        | SS    |   |        | SS    |   |        | SN    |         | 2     |         |         |       |
| Total Organic Halogens         |        | NS    |   |        | NS    |   |        | SS    |         | SS    |         |         |       |
| Мадпезінгі                     |        | NS    |   |        | NS    |   |        | SN    |         | SS    |         |         |       |
| Mangenese                      | 2.20   |       |   | 6.30   |       |   | 3.50   |       | 7.60    |       |         | 0.05    |       |
| Potassiun                      |        | NS    |   |        | NS    |   |        | NS    |         | NS    |         |         |       |
| Sodium                         | 20.00  |       |   | 82.00  |       |   |        | SN    | 24.00   |       | 00:09   |         |       |
| Alkalinity                     | 360.00 |       |   | 300.00 |       |   |        | Q.    | 170.00  |       |         |         |       |
| Calcium                        |        | NS    |   |        | NS    |   |        | SN    |         | SS    |         |         |       |
| Hardness                       | 400.00 |       |   | 420.00 |       |   |        | NS    | 250.00  |       |         |         | 3     |
| Boron                          |        |       |   |        |       |   |        |       | 3       |       |         |         | 0.63  |
| Specific Conductance (unho/cm) | 770.00 |       |   | 780 00 |       |   |        | SS    | 840 00  |       |         |         |       |
|                                |        |       |   |        |       |   |        |       |         |       |         |         |       |

NS - Not Sampled
ND - Not Detected
Det. Limit - Sampling Detection Limit
MCL - Assirumn Contaminant Level: Enforceable Groundwater Standards
MCL - Secondary Maximum Contaminant Level: Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level: Enforceable Groundwater Standards
Childente Concentrations - Not Enforceable Standards

Table A.13: Characteristics of the Des Moines Landfill #4 of Iowa.

LANDFILL:

Des Moines Landfill #4 SLF, Iowa.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

State of Iowa, Department of Natural Resources

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 1.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

Unknown.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Leachate sample taken from leachate wells.

MISCELLANEOUS:

| 1000<br>1000<br>1000<br>1000<br>1000<br>1000<br>1000<br>100  |             | Reruit | 1      | Det Lamit | MCL      | MCL        |          |
|--|-------------|--------|--------|-----------|----------|------------|----------|
| NS   NS  |             | Van    | ND/NS  |           | /da      | <b>5</b> . | 100      |
| Mailed   |             |        | SS     |           |          |            | 700.00   |
| NE   1000   10   |             |        | 2      |           |          |            | 4200.00  |
| 100    |             | T      | S      | 00.01     |          |            | 00.00    |
| 240 NB 040 040 040 040 040 040 040 040 040 04  |             | 00.5   | 2      | 3 2       |          |            | 200      |
| 2.60 NS 1.00  2.440 NS 1.00  3.20 ND 1.00  3.20 NS 1.00  3.20 NS 1.00  12.30 ND 1.00  ND 10.00   | 911         | 0.50   | CN     | 3 0       | 3.00     |            | 20.00    |
| 240 NS 100  2440 NS 500  3030 ND 1000  1230 NS 1000  1230 NS 1000  NS 1000  ND 10000  ND 1000  ND 1000  ND 1000  ND 1000  ND 1000  ND 1000  ND 10000  ND 100000  ND 10000  ND 100000 |             |        | SN     |           |          |            | 2 00     |
| NS   |             | 2.60   |        | 1 00      |          | 700.00     |          |
| 2440   | tone (MEK)  |        | NS     |           |          |            | 4200.00  |
| 24.40 30.30 30.30 30.30 30.30 10.00 11.30 11.30 10.00  | anone       |        | NS     |           |          |            |          |
| 30.30  3.20  3.20  12.30  12.30  12.30  10.0 | nde         | 24.40  |        | 5.00      | 5.00     |            |          |
| 100    |             | 30.30  |        | 1.00      | 1000.00  |            |          |
| 320 NS 100  1230 NS 100  1230 NS 100  NS 1000  ND 10000  ND 100000  ND 10000  ND 10000  ND 10000  ND 10000  ND 10000  ND 100000   | thane       |        | ND     | 1.00      | 200.00   |            |          |
| 12.30  | 9           | 3.20   |        | 1.00      | 3.00     |            |          |
| 12.30   1.00   | nethane     |        | NS     |           |          |            | 2100.00  |
| No.    |             | 12.30  |        | 1.00      | 10000.00 |            |          |
| NE   NE   NE   |             |        |        |           |          |            |          |
| NS  NS  1.00  ND  ND  10.00  ND  ND  ND  ND  ND  ND  ND  ND  ND   |             | L'an   | ND/NS  |           | /ån      | Ìn         | San Page |
| 2.70 ND 50.00 ND 10.00 ND ND 10.00 ND ND 10.00 N |             |        | NS     |           |          |            | 20.00    |
| 2.70   |             |        | SN     |           |          |            | 700.00   |
| ND 5000 ND 1000 ND ND 1000 ND ND ND ND 1000 ND ND ND 1000 ND ND ND 1000 ND ND ND 1000 ND ND 1000 ND ND 1000 ND ND 1000 |             | 2.70   |        | - 8       | 8        |            |          |
| ND   1000   10   |             |        | 2      | 20.00     |          |            | 28000 00 |
| MD 1000 ND 100 | 1)phthalate |        | S      | 10.00     |          |            |          |
| HD 1000 HD 100 | nol         |        | Q      | 10.00     |          |            | 400.00   |
| 10.00   10.0   | alate       |        | QN     | 10.00     |          |            | 700.00   |
| ## PD 10.00   ND 10.00 |             |        | QN     | 10.00     |          |            | 2600.00  |
| ND   10 00     ND   10 00     ND   10 00     NS   10 00     NS   10 00     ND   0.05     NS   NS     NS   NS     NS   NS     NS   NS   |             |        | QN     | 10.00     |          |            | 280.00   |
| ND   10 00   |             |        | Q      | 00.00     |          |            | 9.80     |
| ND   10 00   ND   10 00   ND   10 00   ND   ND   10 00   ND   ND   ND   ND   ND   ND   ND  |             |        | QN     | 10.00     |          |            | 32.00    |
| ND 1000 ND ND 1000 ND 1000 ND 0.05 ND 0.05 ND 0.05 ND 0.05 ND 0.00   |             |        | Ð      | 10.00     |          |            | 350.00   |
| ND 1000  ND 0.05  ND 0.05  ND 0.05  NS N   |             |        | Q.     | 10.00     |          |            | 10.00    |
| ug/1 ND/NS  ug/1 ND/NS  0.07  ND 0.05  NS  |             |        | SZ     |           |          |            | 10.00    |
| NDNS   0.05  |             |        | ON     | 10.00     |          |            | 210.00   |
| ND NS   ND NS   ND   ND   ND   ND   ND   | -           |        |        |           |          |            |          |
| 45   | icides      | ug/l   | ND/NS  |           | (ån      | /An        | /ân      |
| 45. A Color of the |             |        | QN     | 0.05      |          |            | 0.05     |
| ND 0.05  |             | 0.07   |        |           | 2.00     |            |          |
| 72.00 NS   |             |        | QN     | 0.05      |          |            | 0.10     |
| 18.00 NS 1.00  |             |        | NS     |           |          |            | 2.00     |
| 18.00 NS 10.00  18.00 NS 10.00  18.00 NS 5.00  18.00 NS 1.00  19.00 ND 1.00   |             |        | SN     |           |          |            | 0.50     |
| Auto NS  |             |        | NS     |           |          |            | 70.00    |
| NS   |             |        | NS     |           | 70.00    |            |          |
| NS   |             |        | SZ     |           |          |            |          |
| 18.00 NS 5.00 18.00 NS 1.00 ND 1.00 ND 1.00 ND 30.00 72.00 ND 30.00 13.00 5.00 0.50 ND 50.00   |             |        | NS     |           |          |            |          |
| No.    |             |        |        |           |          |            |          |
| 18.00 NS 5.00 NS 1.00 ND 5.00  |             | l/an   | ND/US  |           | l/an     | (An        | l/dn     |
| 18.00 NS 5.00 NS 72.00 ND 1.00 ND 1.00 ND 1.00 ND 1.00 ND 1.00 ND 13.00 13.00 0.50 ND 50.00 N |             |        | SN     |           | 9.00     |            |          |
| NS 1.00 ND 1.00 ND 30.00 12.00 30.00 13.00 5.00 0.50 0.50 ND 50.00   |             | 18.00  |        | 5.00      | 20.00    |            |          |
| ND 1.00<br>ND 30.00<br>72.00 30.00<br>13.00 5.00<br>0.50 0.50  |             |        | SS     |           | 2000.00  |            |          |
| 12.00 ND 30.00<br>12.00 30.00<br>13.00 5.00<br>0.50 0.50   |             |        | GZ     | 00        | 200      |            |          |
| 13.00 30.00<br>13.00 5.00<br>0.50 0.50<br>ND 50.00   |             |        | Q      | 30.00     | 100.00   |            |          |
| 5.00<br>0.50<br>ND 50.00   |             | 72 00  |        | 30.00     | 1000.00  |            |          |
| 0.50<br>ND 50.00   |             | 13.00  |        | 2.00      | 15.00    |            |          |
| ND 50.00   |             | 0.50   |        | 0 0       | 2 00     |            |          |
| 20.00  |             | 3      | CZ     | 200       | 90       |            |          |
| _  |             |        | 2 2    | 20.00     | 3 5      |            |          |
| +  |             |        | N Sign | 3.0       | 20.00    | 200        |          |
| 22   |             |        | 2      |           | 98.      | 100.00     |          |
|  |             |        | SZ S   |           | 2.08     |            | 20,00    |
| Variadium  |             |        | NN     |           |          |            | 3        |
|  |             |        |        |           |          | 200000     |          |



|                          |         | S     |       |         |          | /0.00 |
|--------------------------|---------|-------|-------|---------|----------|-------|
| 2,4-D                    |         | NS    |       | 70.00   |          |       |
| HxCDD                    |         | NS    |       |         |          |       |
| HxCDF                    |         | SN    |       |         |          |       |
|                          |         |       |       |         |          |       |
| Heavy Metals             | l/3n    | ND/NS |       | J∕an    | l∕3n     | L∕3n  |
| Antimony                 |         | NS    |       | 9.00    |          |       |
| Arsenic                  | 18.00   |       | \$.00 | 50.00   |          |       |
| Bariun                   |         | NS    |       | 2000.00 |          |       |
| Cadmium                  |         | ND    | 1.00  | 5.00    |          |       |
| Chromium                 |         | QN    | 30.00 | 100.00  |          |       |
| Copper                   | 72.00   |       | 30.00 | 1000.00 |          |       |
| Lead                     | 13.00   |       | \$.00 | 15.00   |          |       |
| Mercury                  | 0.50    |       | 0.50  | 2.00    |          |       |
| Nickel                   |         | QZ    | 20.00 | 100.00  |          |       |
| Selenium                 |         | ΩN    | 10.00 | \$0.00  |          |       |
| Silver                   |         | NS    |       |         | 100.00   |       |
| Thallium                 |         | NS    |       | 2.00    |          |       |
| Vanadium                 |         | NS    |       |         |          | 49.00 |
| Zinc                     | 403.00  |       | 30.00 |         | \$000.00 |       |
|                          |         |       |       |         |          | ,     |
| Conventional Parameters  | l/dui   | ND/NS |       | /Jun    | me/J     | 2     |
| Biological Oxygen Demand | 170.00  |       | 3.00  |         |          |       |
| Chemical Oxygen Demand   | 130.00  |       | 3.00  |         |          |       |
| Chlorides                | 153.00  |       | 10.00 |         | 250.00   |       |
| Cyanide                  |         | ΩN    | 0.02  | 0.20    |          |       |
| Amnonia, Nitrogen        | 18.40   |       | 1.00  |         |          |       |
| Organic Nitrogen         | 5.10    |       | 10.00 |         |          |       |
| Nitrate                  |         | Q.    | 1.80  | 10.00   |          |       |
| Nitrite                  |         | NS    |       | 1.00    |          |       |
| Iron                     | 49.10   |       | 0.03  |         | 0.30     |       |
| Oil and Grease           |         | NS    |       |         |          |       |
| Hd                       |         | NS    |       |         | 6.8-8.5  |       |
| Phenols (Total)          |         | NS    |       |         |          |       |
| Phosphorus               | 1.30    |       | 1.00  |         |          |       |
| Total Suspended Solids   | 6100.00 |       | 1.00  |         |          |       |
| Total Dissolved Solids   |         | NS    |       |         | 200:00   |       |
| Sulfate                  |         | NS    |       |         | 250.00   |       |
| Total Organic Carbon     |         | NS    |       |         |          |       |
| TOC (Duplicate)          |         | NS    |       |         |          |       |
| Total Organic Halogens   |         | NS    |       |         |          |       |
| Magnesiun                |         | NS    |       |         |          |       |
| Mangenese                |         | NS    |       |         | 0.05     |       |
| Potassium                | 110.00  |       | 1.00  |         |          |       |
| Sodiun                   |         | NS    |       | 160.00  |          |       |
| Alkalinity               |         | NS    |       |         |          |       |
| Calcium                  |         | NS    |       |         |          |       |
| Hardness                 |         | NS    |       |         |          |       |
| Boron                    |         | SN    |       |         |          | 190   |
|                          |         |       |       |         |          |       |

NS - Not Sampled

ND - Not Detected

Dot Limit - Sampling Detection Limit

MCL - Maximum Contaminent Level: Enforceable Groundwater Standards

MCL - Secondary Maximum Contaminent Level: Enforceable Groundwater Standards

Guideace Concentrations - Not Enforceable Standards

Table A.15: Characteristics of the Des Moines Landfill #5 of Iowa.

LANDFILL:

Des Moines Landfill #5 SLF, Iowa.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

State of Iowa, Department of Natural Resources

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 1.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

Unknown.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Leachate sample taken from leachate wells.

MISCELLANEOUS:

| Volatiles Acctone 2-Butanone   | Én     | 0.00   |       |         |        |          |
|--|--------|--------|-------|---------|--------|----------|
| .Butanone  |        |        |       | V2n     | No.    | Van      |
| Butanone   |        | SN     |       |         |        | 700.00   |
|  |        | SZ     |       |         |        | 4200 DO  |
| Carbon Disulfide   |        | 014    |       |         |        | 200      |
| Torona those   |        | 2      | 00.01 |         |        | 3.63     |
| 1 Dishlereding   | 3,3    |        | 300   |         |        | 07.70    |
| - Control of the cont | 2.00   | 1      | 3     |         |        | 300/     |
| 1,2-Dictionoediane   |        | ON.    | 0.40  | 3.00    |        |          |
| I,4-Dioxane  |        | NS     |       |         |        | 200      |
| Ethylbenzene   | 1.90   |        | 1.00  |         | 100:00 |          |
| Methyl Ethyl Ketone (MEK)  |        | NS     |       |         |        | 4200.00  |
| 4-Methyl-2-Pentanone   |        | NS     |       |         |        |          |
| Methylene Chloride   |        | ND     | 2.00  | 5.00    |        |          |
| oluene   | 2.60   |        | 1 00  | 1000 00 |        |          |
| 1 1 1 Trichloroethane  |        | CZ     | 8     | 200.00  |        |          |
| Trichloroethydene  |        | 2      | 8     | 200     |        |          |
| Tichlood   |        | 2 5    | 3     | 3.0     |        |          |
| dense (Test)   | 93.5   | Chi    |       | 00 0000 |        | 7100.00  |
| Aylenes (10tal)  | 2.00   |        | 3     | 100000  |        |          |
|  |        |        |       |         |        |          |
| Semu-1 olanics   | ng,    | ND/NS  |       | 1/da    | /dn    | J/dn     |
| Acenaphthene   |        | NS     |       |         |        | 20.00    |
| Acetophenone   |        | NS     |       |         |        | 700.00   |
| Benzene  |        | QN     | 1.00  | 1.00    |        |          |
| Benzoic Acid   |        | Ę      | 80.00 |         |        | 28000.00 |
| Rie(2-Fiholhexolimhthalate   |        | Ş      | 10.00 |         |        |          |
| 2 4 Dimethylphenol   |        |        | 9     |         |        | 000      |
| - Cancard Amount   |        |        | 30.00 |         |        | 3        |
| Di-n-Buryi pinthalate  |        | QN     | 10 00 |         |        | 700.00   |
| Demyl Phthalate  | 16.00  |        | 10.00 |         |        | 2600.00  |
| Fluoranthene   |        | Ω      | 10.00 |         |        | 280.00   |
| Napthalene   |        | QX     | 10.00 |         |        | 08 9     |
| m&n. Creosol   |        | 2      | 00 01 |         |        | 2        |
|  | +      |        | 200   |         |        | 30.00    |
| in clear   |        | 2      | 20.01 |         |        | 00.00    |
| nellaunene   |        |        | 30.02 |         |        | 0001     |
| Phenol   |        | SS     |       |         |        | 10.00    |
| Рутепе   |        | ΩN     | 10.00 |         |        | 210.00   |
|  |        |        |       |         |        |          |
| Herbicides/Pesticides  | l/an   | ND/NS  |       | Van     | Van    | L'en     |
| Alpha-BHC  |        | CIN C  | 900   |         |        | 900      |
| Air.   |        | 2      | 0.00  | 00.0    |        | 600      |
| CHUIN  |        | Q.     | 0.05  | 7.00    |        |          |
| Dieldrin   |        | ND     | 0.05  |         |        | 0.10     |
| Dimethoate   |        | SZ     |       |         |        | 2.00     |
| Disulfoton   |        | SN     |       |         |        | 05.0     |
| 245 T  |        | 613    |       |         |        | 20.02    |
| 1-0-1  |        | 22     |       |         |        | 0.07     |
| 2,4-D  |        | SN     |       | 70.00   |        |          |
| KCDD   |        | NS     |       |         |        |          |
| HACDE  |        | NG     |       |         |        |          |
| TOO Y  |        | CN     |       |         |        |          |
|  |        |        |       |         |        |          |
| Heavy Metals   | ng/l   | SN/QN  |       | 520     | /an    | ng'n     |
| Antimony   |        | 22     |       | 90.9    |        |          |
|  | 27.00  |        | 90,5  | 00 03   |        |          |
| Sellic   | 27.00  |        | 3.6   | 20.00   |        |          |
| Barium   |        | NS     |       | 2000.00 |        |          |
| Cadmium  |        | ND     | 1.00  | 5.00    |        |          |
| Chromitem  |        | 2      | 30.00 | 2000    |        |          |
|  | 1      | 2      | 20.00 | 00.00   |        |          |
| Copper   | 57.00  |        | 30.00 | 1000.00 |        |          |
| Lead   | 40.00  |        | 5.00  | 15.00   |        |          |
| Mercury  | 0.50   |        | 0.50  | 2.00    |        |          |
| Nicks  | 00 00  |        | 00.05 | 0000    |        |          |
| CARE   | 33.00  | !      | 30.00 | 30.00   |        |          |
| Selemum  |        | a<br>N | 10.00 | \$0.00  |        |          |
| Silver   |        | NS     |       |         | 100.00 |          |
| Thallium   |        | SN     |       | 2.00    |        |          |
| Vanadium   |        | SZ     |       |         |        | 49 00    |
| 7,000  | 135.00 |        | 90.05 |         | 0000   |          |
|  | 133.00 |        | 30.00 |         | 30000  |          |
|  |        |        |       |         |        |          |
|  |        |        |       |         |        |          |

| Anumenty                 |        | SN     |       | 3       |          |         |
|--------------------------|--------|--------|-------|---------|----------|---------|
| Arsenic                  | 37.00  |        | \$ 00 | \$0.00  |          |         |
| Bariun                   |        | NS     |       | 2000.00 |          |         |
| Cadmium                  |        | QN     | 00.1  | 5.00    |          |         |
| Chromium                 |        | ND     | 30.00 | 100.00  |          |         |
| Copper                   | 57.00  |        | 30.00 | 1000.00 |          |         |
| Lead                     | 40.00  |        | 5.00  | 15.00   |          |         |
| Mercury                  | 0.50   |        | 0.50  | 2.00    |          |         |
| Nickel                   | 00:66  |        | 80.00 | 100.00  |          |         |
| Selenium                 |        | QN     | 10.00 | \$0.00  |          |         |
| Silver                   |        | NS     |       |         | 100.00   |         |
| Thalliun                 |        | NS     |       | 2.00    |          |         |
| Vanadium                 |        | SN     |       |         |          | 49.00   |
| Zinc                     | 135.00 |        | 30.00 |         | \$000.00 |         |
|                          |        |        |       |         |          |         |
| Conventional Parameters  | mg/l   | ND/NS  |       | mg/l    | mg/l     | 1/3 120 |
| Biological Oxygen Demand | 15.00  |        | 3.00  |         |          |         |
| Chemical Oxygen Demand   | 14.00  |        | 3.00  |         |          |         |
| Chlorides                | 39.80  |        | 10.00 |         | 250.00   |         |
| Cyanide                  |        | QN     | 0.02  | 0.20    |          |         |
| Anmonia, Nitrogen        |        | ND     | 1.00  |         |          |         |
| Organic Nitrogen         | 17.90  |        | 10.00 |         |          |         |
| Nitrate                  |        | Q      | 1.00  | 10.00   |          |         |
| Nitrite                  |        | NS     |       | 1.00    |          |         |
| Iron                     | 48.50  |        | 0.03  |         | 0.30     |         |
| Oil and Grease           |        | NS     |       |         |          |         |
| pH                       |        | SN     |       |         | 6.5-8.5  |         |
| Phenols (Total)          |        | NS     |       |         |          |         |
| Phosphorus               |        | ND     | 1.00  |         |          |         |
| Total Suspended Solids   |        | 140.00 | 1.00  |         |          |         |
| Total Dissolved Solids   |        | NS     |       |         | 500.00   |         |
| Sulfate                  |        | NS     |       |         | 250.00   |         |
| Total Organic Carbon     |        | SN     |       |         |          |         |
| TOC (Duplicate)          |        | NS     |       |         |          |         |
| Total Organic Halogens   |        | NS     |       |         |          |         |
| Magnesiun                |        | NS     |       |         |          |         |
| Mangenese                |        | NS     |       |         | 0.05     |         |
| Potassium                | 3.02   |        | 1.00  |         |          |         |
| Sodium                   |        | NS     |       | 160.00  |          |         |
| Alkaliuity               |        | SN     |       |         |          |         |
| Calcium                  |        | NS     |       |         |          |         |
| Hardness                 |        | NS     |       |         |          |         |
| Boron                    |        | NS     |       |         |          | 0.63    |
| Confedence Condendary    |        | N.T.O. |       |         |          |         |

NB - Not Sampled
ND - Not Detected
ND - Not Detected
Dot Limin - Simpling Detection Limit
MCL - Maximum Contaminant Level: Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level: Enforceable Groundwater Standards
Outleaver Courant zincus NA Enforceable Standards

Table A.17: Characteristics of the Glastonbury Bulky Waste Landfill of Connecticut.

LANDFILL:

Glastonbury Bulky Waste Landfill, Connecticut.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

Bulky Waste Leachate Characterization Survey

Maurice Hamel, Connecticut Department of Environmental

Protection

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 2.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

15 acres.

YEARS IN SERVICE:

Opened in 1977.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Leachate sample taken from monitor well B2, approximately 10

feet from the toe of the landfill.

MISCELLANEOUS:

Table A.18: Sampling for the Glastonbury Bulky Waste Landfill of Connecticut.

|                            | *          | July-1988 | Det Limit | , a    | 12 -  | Z Z       | Octa      | October-1988 |        | December-1988<br>Result D | Det Limit | Primary<br>MCL. | Secondary | Guidance |
|----------------------------|------------|-----------|-----------|--------|-------|-----------|-----------|--------------|--------|---------------------------|-----------|-----------------|-----------|----------|
| Volatiles                  | Nan<br>nan | ND/NS     |           | l/an   | ND/NS |           | Van       | D/NS         | 530    | ND/NS                     |           | 1/48            | Van       | Van      |
| Acetone                    |            | NS        |           |        | NS    |           | Г         | NS           |        | NS                        |           |                 |           | 700.00   |
| 2-Butanone                 |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           |                 |           | 4200.00  |
| Carbon Disulfide           |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           |                 |           | 700.00   |
| Chloromethane              |            | SN        |           |        | NS    |           |           | NS           |        | SN                        |           |                 |           | 2.70     |
| 1,1-Dichloroethane         |            | SN        |           |        | SN    |           |           | NS           |        | SN                        |           |                 |           | 700.00   |
| 1,2-Dichloroethane         |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           | 3.00            |           |          |
| 1,4-Dioxane                |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           |                 |           | 5.00     |
| Ethylbenzene               |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           |                 | 700.00    |          |
| Methyl Ethyl Ketone (MEK)  |            | NS        |           |        | NS    |           |           | NS           |        | SN                        |           |                 |           | 4200.00  |
| 4-Methyl-2-Pentanone       |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           |                 |           |          |
| Methylene Chloride         |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           | 5.00            |           |          |
| Toluene                    |            | SN        |           |        | NS    |           |           | NS           |        | NS                        |           | 1000.00         |           |          |
| 1.1.1-trichloroethane      |            | NS        |           |        | NS    | T         |           | NS           |        | NS.                       |           | 200.00          |           |          |
| Trichloroethylene          |            | SZ        |           |        | SZ    | T         |           | SZ           |        | SZ.                       |           | 3.00            |           |          |
| Trichlorofluoromethane     |            | SZ.       |           |        | S.Z.  | T         | T         | SN           |        | SZ.                       |           | 200             |           | 2100 00  |
| Yulenes (Total)            |            | No        |           |        | Ne    |           | T         | NG           |        | NA.                       |           | 1000000         |           |          |
| Aylenes (16m)              |            | 22        |           | Ī      | C.    | T         | T         | ON ON        |        | CNI                       |           | 10000.00        |           |          |
| Semi-Volation              | 1,011      | NON       |           | 7      | NUN   | $\dagger$ |           | NOW          | Can    | SNON                      |           | Umu             | Vari      | V        |
| Acensolythene              |            | NIG       |           |        | PIN   | T         | 4         | Me           | A      | PIG                       |           |                 | .45       | 30.00    |
| Acetophenone               |            | 2 SZ      |           |        | SZ    | T         | T         | SN           |        | SN                        |           |                 |           | 200.00   |
| Beizelle                   |            | 22        |           |        | 5N    |           | T         | 82           |        | 22                        |           | 1.00            |           | 20.00    |
| Benzoic Acid               |            | Ne        |           |        | SIN   | T         | T         | Me           |        | N.                        |           | 3               |           | 28000 00 |
| Bis(2, Ethyllawydhyldalate |            | 2 22      | Ī         |        | 014   | T         | T         | S N          |        | O. N.                     |           |                 |           | 00.00007 |
| 2 4. Dimetholishand        |            | 014       |           | T      | 2012  | T         | $\dagger$ | 270          |        | S N                       |           |                 |           | 400.00   |
| City Buthel obstitutes     |            | o N       |           |        | 2 074 | $\dagger$ | T         | S No         |        | S S                       |           |                 |           | 20.00    |
| Diethyl Dhihalata          |            | Ne        |           |        | SIN   | T         | T         | S S S        | -      | No                        |           |                 |           | \$600 P  |
| Flioranthene               |            | Ne        |           | Ī      | Ne    | T         | T         | Ne           |        | Z Z                       |           |                 |           | 2000     |
| Nanthalane                 |            | N         |           | Ī      | S N   | T         | Ī         | 2 82         | -      | NA NA                     |           |                 |           | 6.80     |
| m&n-Creosol                |            | N.        |           |        | 2 2   |           | Ī         | SN           |        | NA.                       |           |                 |           | 35.00    |
| o-Created                  |            | 2 22      |           |        | 2 2   | T         | T         | 50           | +      | 2 2                       |           |                 |           | 350.00   |
| Plenaturene                |            | SN        |           |        | SN    | T         | T         | SN           | -      | SN                        |           |                 |           | 10.00    |
| Phenol                     |            | NS        |           |        | 82    |           |           | SZ           |        | SS                        |           |                 |           | 10.00    |
| Pyrene                     |            | NS        |           |        | NS    | T         |           | SN           | L      | SN                        |           |                 |           | 210.00   |
|                            |            |           |           |        |       |           |           |              |        |                           |           |                 |           |          |
| Herblcides/Pesticides      | l/dn       | ND/NS     |           | /an    | ND/NS |           | l/ân      | ND/NS        | l/ån   | ND/NS                     |           | ng/l            | l/ân      | l/gu     |
| Alpha-BHC                  |            | NS        |           |        | SN    |           |           | NS           |        | NS                        |           |                 |           | 0.05     |
| Endrin                     |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           | 2.00            |           |          |
| Dieldrin                   |            | NS        |           |        | NS    |           | 1         | NS           |        | SS                        |           |                 |           | 0.10     |
| Dimethoate                 |            | NS        |           |        | SZ.   | 1         |           | SZ           |        | SN                        |           |                 |           | 2.00     |
| Distillation               |            | NS        |           |        | SN    |           |           | NS           |        | SN                        |           |                 |           | 0.50     |
| 2,4,5-T                    |            | SZ S      |           |        | S S   |           |           | SN           | _      | SZ                        |           | 000             |           | 70.00    |
| 4.4-D                      |            | NS NS     |           | Ī      | N SI  |           | Ì         | Z Z          | +      | S S                       |           | 00:00           |           |          |
| HXCDE                      |            | SN SN     |           |        | SN    |           |           | SN           | -      | SZ SZ                     |           |                 |           |          |
|                            |            |           |           |        | 2     | T         |           |              |        |                           |           |                 |           |          |
| Heary Metals               | /dn        | ND/NS     |           | l∕a'n  | ND/NS |           | ug/l      | ND/NS        | ng/l   | ND/NS                     |           | ug/l            | l∕an      | ug/l     |
| Antimony                   |            | NS        |           |        | NS    |           |           | NS           |        | SS                        |           | 6 00            |           |          |
| Arsenic                    |            | QN        |           |        | Ω     |           | 20.00     |              |        | QV                        |           | 20.00           |           |          |
| Barium                     | 400.00     |           |           | 300.00 |       | 1         | 800.00    |              | 100.00 |                           |           | 2000.00         |           |          |
| Cadmium                    | 20.00      |           |           | Ī      | QN    | 1         | 00.00     |              | 10.00  | !                         |           | 2005            |           |          |
| Chromain                   | 10.00      |           |           | 0000   | Q.    | 1         | 40.00     |              | 3      | Q.                        |           | 00.001          |           |          |
| Copper                     | 20.00      |           |           | 20.00  | +     |           | 00.020    |              | 20.00  |                           |           | 15.00           |           |          |
| Marginy                    | 00.00      | CN        | T         | 40.00  | CN    | T         | 3         | CZ.          | 40.00  | S                         |           | 2 00            |           |          |
| Nickal                     | 00 03      | 2         |           |        | Ne    | T         | T         | Ne           |        | No.                       |           | 100 00          |           |          |
| Selenium                   | 00.00      | CZ.       |           |        | S CN  |           | T         | 2 5          |        | S                         |           | \$0.00          |           |          |
| Silver                     |            | QN        |           |        | Q.    | T         |           | Q.           |        | Q                         |           |                 | 100.00    |          |
| Thallium                   |            | NS        |           |        | NS    |           |           | NS           |        | NS                        |           | 2.00            |           |          |
| Vanadiun                   |            | NS        |           |        | NS    |           |           | NS           | 1      | NS                        |           |                 |           | 49.00    |
| Zuic                       | 70.00      |           | -         |        | S.    |           |           | 200          |        | S                         |           |                 | 2000.00   |          |
|                            |            |           |           |        |       |           |           |              |        |                           |           |                 |           |          |

| 2.4-D                          |         | l sn  |         | SN.   |         | NS       |        |         | 2        | 00.01   |         |       |
|--------------------------------|---------|-------|---------|-------|---------|----------|--------|---------|----------|---------|---------|-------|
| HxCDD                          |         | NS    |         | NS    |         | NS       |        | -       | NS       |         |         |       |
| HxCDF                          |         | NS    |         | SN    |         | NS       |        | +       | NS       |         |         |       |
|                                |         |       |         |       |         |          |        | -       | 1        |         |         | Ī     |
| Heavy Metals                   | l/an    | ND/UN | Vân     | ND/US | √3a     | ND/NS    | /an    | +       | ND/NS    | l'än    | /an     | 100   |
| Antimony                       |         | SN    |         | NS    |         | NS       |        | -       | NS       | 00.9    |         |       |
| Arsenic                        |         | QV    |         | QN    | 20.00   |          |        | 4       | ND       | 20:00   |         |       |
| Barium                         | 400.00  |       | 300.00  | L     | 800.00  |          | 100.00 | 8       |          | 2000.00 |         |       |
| Cadmin                         | 20.00   |       |         | S     | 10.00   |          | 10.00  | -       |          | 200     |         |       |
| Chromium                       | 10 00   |       |         | S     | 40.00   |          |        | -       | NO<br>ON | 100.00  |         |       |
| Circumo                        | 80.05   |       | 30.00   |       | 620.00  |          | 20.00  | 8       |          | 1000.00 |         |       |
| ladding.                       | 60.00   |       | 40.00   |       | 40.00   |          | 40.00  | 00      |          | 15.00   |         |       |
| read                           | 20.00   | 5     |         | Ç     |         | QZ       |        | -       | QN       | 2.00    |         |       |
| Mercury                        |         | 2     |         | 014   |         | NA<br>NA |        | -       | NS       | 100.00  |         |       |
| Nickel                         | 80.00   | 1     |         | 2     |         | 2 2      |        | +       | 5        | \$0.00  |         |       |
| Selenium                       |         | Q     |         | Q     |         | 2        |        | +       |          |         | 00 001  |       |
| Silver                         |         | QN    |         | g     |         | QN       |        | +       | 2 5      | 98,0    | 20.00   |       |
| Thalliun                       |         | NS    |         | NS    |         | NS       |        | +       | SN       | 3       |         | 9     |
| Vanadiun                       |         | NS    |         | ZZ    |         | NS       |        | +       | NZ.      | <br> -  | 00 000  | 49.00 |
| Zinc                           | 70.00   |       |         | NS    |         | NS       |        | +       | SZ       | +       | 2000.00 |       |
|                                |         |       |         |       |         |          |        | +       |          |         | ,       |       |
| Conventional Parameters        | Na Ea   | ND/NS | 1/8m    | ND/UN | 1/3     | ND/NS    | B      | +       | ND/NS    | m m     | mgm     | Zu.   |
| Biological Oxvoen Demand*      | 70.00   |       | 20.00   | ⊢     | 24.00   |          | 16     | 16.00   |          |         |         |       |
| Chemical Oxygen Demand         | 30.00   |       | 13.00   |       |         | ND       | 15.    | 15.00   |          |         |         |       |
| Chlorides                      | 21 00   |       | 17.00   |       | 20.00   |          | 18     | 18.00   |          |         | 250.00  |       |
| Cvanide                        |         | 2     |         | S     |         | ND       | 0.     | 0.03    |          | 0.20    |         |       |
| Ammonia, Nitrogen              | 0.10    |       |         | QN    |         | QN       | 0      | 0.04    |          |         |         |       |
| Organic Nitrogen               | 1.10    |       | 06:0    |       | 0.32    |          | 0      | 0.32    |          |         |         |       |
| Nitrate                        | 4.60    |       | 5.30    |       | 3.00    |          | S.     | 5.10    |          | 00.00   |         |       |
| Nitrite                        | 10.0    |       | 0.02    |       | 0.02    |          | 0      | 20.0    |          | 08.     | ļ       |       |
| Iron                           | 0.20    |       | 0.40    |       | 33.00   |          | 14     | 14.00   |          |         | 0.30    |       |
| Oil and Grease                 |         | SN    |         | NS    |         | SN       |        | +       | NS       |         |         |       |
| Ho                             | 7.30    |       | 06.9    |       | 7.00    |          | 9      | 6.70    |          | 1       | 6.5-8.5 |       |
| Phenols (Total)                |         | SX    |         | NS    |         | NS       |        | +       | NS       |         |         |       |
| Phosphorus                     |         | SN    |         | NS    |         | NS       |        | +       | NS       |         |         |       |
| Total Suspended Solids         | 2000.00 |       | 3600.00 | 0     | 1900.00 |          | 240    | 2400.00 |          |         | 1       |       |
| Total Dissolved Solids         | 700.00  |       | 700.00  | 0     | 630.00  |          | 72(    | 720.00  |          |         | 200.00  |       |
| Sulfate                        | 42.00   |       | 36.00   |       | 44.00   |          | 28     | 28.00   |          |         | 250.00  |       |
| Total Organic Carbon           |         | NS    |         | NS    |         | SZ       |        |         | NS       |         |         |       |
| TOC (Duplicate)                |         | SN    |         | NS    |         | NS       |        | 1       | NS       |         |         |       |
| Total Organic Halogens         |         | SN    |         | NS    |         | SN       |        | +       | NS       |         |         |       |
| Magnesium                      |         | SN    |         | NS    |         | SN       |        |         | NS       | 1       |         |       |
| Mangenese                      | 0.07    |       | 80.0    |       | 2.10    |          | 3      | 3.10    |          |         | 0.05    |       |
| Potassium                      |         | SN    |         | NS    |         | NS       |        | +       | NS       |         |         |       |
| Sodium                         | 61.00   |       | 78.00   |       | 24.00   |          | 33     | 33.00   |          | 160.00  |         |       |
| Alkalinity                     | \$00.00 |       | 440.00  |       | \$50.00 |          | 26     | 260.00  |          |         |         |       |
| Calcium                        |         | NS    |         | SS    |         | NS.      |        | +       | NS       |         |         |       |
| Hardness                       | 440.00  |       | 720.00  |       | 200.00  |          | 25     | 250.00  |          |         |         | 3     |
| Boron                          |         | NS    |         | SS    |         | NS       |        | 1       | NS       |         |         | 0.03  |
| Specific Conductance (umho/cm) | 970.00  |       | 220.00  | 0     | 1000.00 |          | 88     | 980.00  |          | -       |         |       |
|                                |         |       |         |       |         |          |        |         |          |         |         |       |

NS - Not Sampled
ND - Not Detected
Dot Limin - Sampling Detection Limit
MCL - Maximum Contaminant Level, Endorceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level, Endorceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level, Endorceable Groundwater Standards
(Milliance Concentrations). Not Enforceable Standards

Table A.19: Characteristics of the Groton Bulky Waste Landfill of Connecticut.

LANDFILL:

Groton Bulky Waste Landfill, Connecticut.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

Bulky Waste Leachate Characterization Survey

Maurice Hamel, Connecticut Department of Environmental

Protection

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 2.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

33 acres.

YEARS IN SERVICE:

Opened in 1978.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Leachate sample taken from seep at the toe of landfill.

MISCELLANEOUS:

Table A.20: Sampling for the Groton Wells Bulky Waste Landfill of Connecticut.

|                             | Rea    | Result | Det Limit | Result D |          | Det Limit     | MCL     | MCL     | Conc     |
|-----------------------------|--------|--------|-----------|----------|----------|---------------|---------|---------|----------|
| /olatiles                   | l∕ān   | SN/QN  |           | l∕an     | ND/NS    |               | ng/l    | l∕an    | /ån      |
| Acetone                     |        | SN     |           |          | NS       |               |         |         | 700.00   |
| 2-Butanone                  |        | SN     |           |          | NS       |               |         |         | 4200.00  |
| Carbon Disulfide            |        | SN     |           |          | NS       |               |         |         | 700.00   |
| Chloromethane               |        | SN     |           |          | NS       |               |         |         | 2.70     |
| 1-Dichloroethane            |        | S      |           |          | NS       | _             |         |         | 700.00   |
| 1 2-Dichloroethane          |        | SN     |           |          | SN       |               | 3.00    |         |          |
| 4-Dioxane                   |        | SN     |           |          | SZ       |               |         |         | 5.00     |
| Data Description            |        | NIC    |           |          | SZ       |               |         | 700.00  |          |
| ilyluciizatie               |        | ON     |           |          | SN       | $\frac{1}{1}$ | Ī       |         | 4200 00  |
| Memyl Emyl Ketone (MEK.)    |        | CNI    |           |          | 01.4     |               | T       |         |          |
| 4-Methyl-2-Pentanone        |        | 2      |           |          | CNI      |               | 5       |         |          |
| Methylene Chlonde           |        | N      |           |          | Z.       | 1             | 30.5    |         |          |
| Toluene                     |        | SZ     |           |          | Na<br>Na | 1             | 30:00   |         |          |
| 1,1-trichloroethane         |        | SN     |           |          | NS       | 2             | 200.00  |         |          |
| Trichloroethylene           |        | SN     |           |          | SN       |               | 3.00    |         |          |
| - inhibited floorest affine |        | 82     |           |          | NS       |               |         |         | 2100.00  |
| Charles Charles Charles     |        | νIO    |           |          | 27       | 15            | 1000000 |         |          |
| Xylenes (Total)             |        | CVI    |           |          |          |               |         |         |          |
|                             |        | SPOR   |           | 1,000    | SNICH    | -             | 1/011   | 1/011   | 1101     |
| Semi-Volatiles              | ng/s   | NDINS  |           | i An     | evilari. |               |         | . 4     | 2        |
| Acenaphthene                |        | NS     |           |          | NN       |               |         |         | 70.00    |
| Acetophenone                |        | SZ     |           |          | NS       |               |         |         | 700.00   |
| on real to                  |        | SZ     |           |          | SN       |               | 1.00    |         |          |
| Delizelle                   |        | 21.    |           |          | MG       | $\mid$        |         |         | 28000 00 |
| Benzoic Acid                |        | SZ.    |           |          | CAL      |               | T       |         |          |
| Bis(2-Ethylhexyl)phthalate  |        | NS     |           |          | NS       |               |         |         |          |
| 2.4-Dimethylphenol          |        | SN     |           |          | NS       |               |         |         | 400.00   |
| Di-n-Butyl phthalate        |        | SN     |           |          | NS       |               |         |         | 700.00   |
| Child Distractor            |        | No.    |           |          | SN       |               |         |         | \$600.00 |
| ediyi Filmaate              |        | 2017   |           |          | N.O.     |               | Ī       |         | 280.00   |
| Fluoranthene                |        | SZ.    |           |          | CNI      |               |         |         | 000      |
| Napthalene                  |        | NS     |           |          | NS       |               |         |         | 0.80     |
| m&p-Creosol                 |        | NS     |           |          | NS       |               |         |         | 33.00    |
| o-Creosol                   |        | SN     |           |          | NS       |               |         |         | 320.00   |
| Phenathrene                 |        | SN     |           |          | NS       |               |         |         | 10.00    |
| Phenol                      |        | SZ     |           |          | NS       |               |         |         | 10.00    |
|                             |        | NIG    |           |          | N.Z.     |               |         |         | 210.00   |
| Pyrene                      |        | GV.    |           |          |          | $\dagger$     | Ī       |         |          |
|                             |        |        |           | ,        |          | +             | ,       |         | 1        |
| Herbicides/Pesticides       | ng/l   | ND/NS  |           | l/ân     | ND/NS    |               | l/din   | ug/l    | ign<br>i |
| Alpha-BHC                   |        | SN     |           |          | NS       |               |         |         | 0.05     |
| Foderin                     |        | SZ     |           |          | SN       |               | 2.00    |         |          |
| inlight                     |        | SZ     |           |          | NS       |               |         |         | 0.10     |
| Cloud III                   |        | 214    |           |          | NG       |               |         |         | 2 00     |
| Dunethoate                  |        | CN.    |           |          | CAL      | l             | T       |         | 9        |
| Disulfoton                  |        | NS     |           |          | SZ.      | +             |         |         | 05.0     |
| 4.5-T                       |        | SZ     |           |          | NS       |               |         |         | 70.00    |
| 4-D                         |        | NS     |           |          | NS       |               | 70.00   |         |          |
| 900                         |        | NIG    |           |          | SN       |               |         |         |          |
| HXCDD                       |        | CA.    |           |          | 210      |               |         |         |          |
| xCDF                        |        | z<br>Z |           |          | 22       |               |         |         |          |
|                             |        |        |           |          |          |               |         |         |          |
| Heavy Metals                | l/dn   | ND/NS  |           | l/dn     | ND/NS    |               | ng/J    | l/gu    | /an      |
| A reference                 |        | SZ     |           |          | SN       |               | 00.9    |         |          |
| nameny .                    |        | 4      |           |          | C.Z      |               | 50.00   |         |          |
| Arsenic                     |        |        |           | 00.00    | 2        | 1             | 0000    |         |          |
| Bariun                      | 300.00 |        |           | 100.00   |          | 7             | 0000    |         |          |
| Cadmium                     |        | Q.     |           | 10.00    |          |               | 2.00    |         |          |
| Chrominm                    |        | QX     |           |          | QN       | _             | 100.00  |         |          |
|                             | 20.00  |        |           | 40.00    |          |               | 1000.00 |         |          |
| india.                      | 900    |        |           | 20.00    |          |               | 15.00   |         |          |
| ead                         | 40.00  |        |           | 20.00    | 4        |               |         |         |          |
| Mercury                     |        | QN     |           |          | ND.      |               | 7.00    |         |          |
| Nickel                      |        | SZ     |           |          | ND       |               | 100.00  |         |          |
| Calanium                    |        | CZ     |           |          | QN       |               | \$0.00  |         |          |
| Scientific Co.              |        | 2      |           |          |          |               |         | 00000   |          |
| 1                           |        |        |           |          | 2        | -             |         | 100 001 |          |
| II ANII A                   |        | 2      |           |          | QN       | 1             |         | 100.00  |          |

| Copper                         | 20.00  |       | 40. | 40.00  |       | 11 | 1000:00 |          |       |  |
|--------------------------------|--------|-------|-----|--------|-------|----|---------|----------|-------|--|
| Lead                           | 40.00  |       | 70. | 70.00  |       |    | 15.00   |          |       |  |
| Mercury                        |        | QN    |     |        | QN    |    | 2.00    |          |       |  |
| Nickel                         |        | NS    |     |        | ND    | 1  | 100.00  |          |       |  |
| Selenium                       |        | QN    |     |        | ND    | •  | 50.00   |          |       |  |
| Silver                         |        | ΩN    |     |        | ND    |    |         | 100.00   |       |  |
| Thallium                       |        | SN    |     |        | NS    |    | 2.00    |          |       |  |
| Vanadium                       |        | SN    |     | Ī      | NS    |    |         |          | 49.00 |  |
| Zinc                           |        | NS    |     |        | NS    |    |         | \$000.00 |       |  |
|                                |        |       |     |        |       |    |         |          |       |  |
| Conventional Parameters        | l/gm   | SN/QN | m   | mg/l   | ND/NS |    | l/gm    | l'agu    | mg/   |  |
| Biological Oxygen Demand       | 28.00  |       |     |        | NS    | 1  |         |          |       |  |
| Chemical Oxygen Demand         | 00.89  |       | 35  | 35.00  |       | -  |         |          |       |  |
| Chlorides                      | 15.00  |       | .8  | 8.00   |       |    |         | 250.00   |       |  |
| Cyanide                        |        | ΩN    | 0   | 60.0   |       | +  | 0.20    |          |       |  |
| Ammonia, Nitrogen              | 0.50   |       | 0   | 0.30   |       | -  |         |          |       |  |
| Organic Nitrogen               | 0.07   |       | 0.  | 0.50   |       |    |         |          |       |  |
| Nitrate                        |        | QN    | 0   | 0.10   |       |    | 10.00   |          |       |  |
| Nitrite                        |        | QN    | 0   | 0.01   |       |    | 1.00    |          |       |  |
| Iron                           | 2.50   |       |     |        | NS    |    |         | 0.30     |       |  |
| Oil and Grease                 |        | SN    |     |        | NS    |    |         |          |       |  |
| Hd                             | 6.70   |       | 9   | 6.20   |       |    |         | 6.5-8.5  |       |  |
| Phenols (Total)                |        | SN    |     |        | NS    |    |         |          |       |  |
| Phosphorus                     |        | SN    |     |        | NS    |    |         |          |       |  |
| Total Suspended Solids         | 270.00 |       | 53  | 53.00  |       |    |         |          |       |  |
| Total Dissolved Solids         | 400.00 |       | 44( | 440.00 |       |    |         | 500.00   |       |  |
| Sulfate                        | 40.00  |       | 200 | 200.00 |       |    |         | 250.00   |       |  |
| Total Organic Carbon           |        | NS    |     |        | NS    | +  |         |          |       |  |
| TOC (Duplicate)                |        | NS    |     |        | NS    | +  |         |          |       |  |
| Total Organic Halogens         |        | SN    |     |        | SN    | +  |         |          |       |  |
| Magnesiun                      |        | NS    |     |        | NS    |    |         |          |       |  |
| Mangenese                      | 5.80   |       | 1   | 1.10   |       |    |         | 0.05     |       |  |
| Potassium                      |        | SN    |     |        | NS    |    |         |          |       |  |
| Sodium                         | 17.00  |       | 11  | 11.00  |       |    | 160.00  |          |       |  |
| Alkalinity                     | 280.00 |       | 35  | 58.00  |       |    |         |          |       |  |
| Calcium                        |        | SN    |     |        | NS    |    |         |          |       |  |
| Hardness                       | 280.00 |       | 30  | 300.00 |       |    |         |          |       |  |
| Boron                          |        | NS    |     |        | NS    | 1  |         |          | 0.63  |  |
| Specific Conductance (unho/cm) | 610.00 |       | 53  | 530.00 |       | 1  |         |          |       |  |

NS - Not Sampled
ND - Not Detected
ND - Not Detected
Det Limit - Sampling Detection Limit
MCL - Maximum Contaminant Level; Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards
Cuidance Concentrations - Not Enforceable Standards

Table A.21: Characteristics of the Guilford Bulky Waste Landfill of Connecticut.

LANDFILL:

Guilford Bulky Waste Landfill, Connecticut.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

Bulky Waste Leachate Characterization Survey

Maurice Hamel, Connecticut Department of Environmental

Protection

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 2.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris and wood.

ACREAGE:

5 acres.

YEARS IN SERVICE:

Opened in 1973.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Leachate sample taken from seep 100 feet southeast of culvert at a

stone wall.

MISCELLANEOUS:

Runoff may sometimes dilute samples.

Table A.22: Sampling for the Guilford Bulky Waste Landfill of Connecticut.

|  | 2      | June-1988<br>Result | Det Limit | R      | October-1988 Result | Det Limit | Primary  | Secondary<br>MCL | Conc      |
|--|--------|---------------------|-----------|--------|---------------------|-----------|----------|------------------|-----------|
| Volatiles  | l/gu   | ND/NS               |           | l∕an   | ND/NS               |           | l∕3n     | l/ån             | l/an      |
| Acetone  |        | NS                  |           |        | SN                  |           |          |                  | 700.00    |
| 2-Butanone   |        | NS                  |           |        | SN                  |           |          |                  | 4200.00   |
| Carbon Disutfide   |        | SZ                  |           |        | SN                  |           |          |                  | 700.00    |
| Thoromethane   |        | 2                   |           |        | 2                   |           |          |                  | 2.70      |
| 1. Dichlorosthans  |        | 2                   |           |        | 2                   |           |          |                  | 200.00    |
| 2 Dichlorosthone   |        | N.O.                |           |        | NIG.                |           | 3.00     |                  |           |
| z-Dicinci contante   |        | C.                  |           |        | ON.                 |           | 3.6      |                  | 00.0      |
| 1,4-Dioxane  |        | SZ.                 |           |        | SZ.                 |           |          |                  | 3.00      |
| thylbenzene  |        | SN                  |           |        | S.                  |           |          | 700.00           |           |
| Methyl Ethyl Ketone (MEK)  |        | NS                  |           |        | SZ                  |           |          |                  | 4200.00   |
| 4-Methyl-2-Pentanone   |        | NS                  |           |        | NS                  |           |          |                  |           |
| Methylene Chloride   |        | NS                  |           |        | NS                  |           | 5.00     |                  |           |
| oluene   |        | SN                  |           |        | SZ.                 |           | 1000.00  |                  |           |
| 1 1-trichloroethane  |        | 2                   |           |        | uZ.                 |           | 200.00   |                  |           |
| richloroathylana   |        | 2                   |           |        | WZ.                 |           | 3.00     |                  |           |
| Transfermiyane   |        | OIA.                |           |        | OIN                 |           | 3.00     |                  | 3100 00   |
| Inchlorofluoromethane  |        | Z.                  |           |        | SN.                 |           |          |                  | 2100.00   |
| Xylenes (Total)  |        | N N                 |           |        | SS                  |           | 00.00001 |                  |           |
|  |        |                     |           |        |                     |           |          |                  |           |
| Semi-Volatiles   | l'ân   | ND/NS               |           | San    | ND/NS               |           | l/gu     | l/ån             | /ðn       |
| Acenaphthene   |        | NS                  |           |        | SZ                  |           |          |                  | 20.00     |
| Acetophenone   |        | NS                  |           |        | SN                  |           |          |                  | 00'00L    |
| Benzene  |        | SZ                  |           |        | SZ                  |           | 1.00     |                  |           |
| annessin A rid   |        | NG                  |           |        | δN                  |           |          |                  | 28000 00  |
| Dis/2 Det. them the tested   |        | SIX.                |           |        | OIN                 |           |          |                  | 20,000.00 |
| is t-ruismes yi pinniadie  |        | GN.                 |           |        | CNI                 |           |          |                  | 0000      |
| 2,4-Dimethylphenol   |        | NS                  |           |        | NS                  |           |          |                  | 400.00    |
| i-n-Butyl phthalate  |        | SS                  |           |        | SS                  |           |          |                  | 700.00    |
| Diethyl Phthalate  |        | S.N.                |           |        | S.Z.                |           |          |                  | \$600.00  |
| Charles and the same   |        | MIG                 |           |        | NIC                 |           |          |                  | 00 000    |
| inordination and a second  |        | CNI                 |           |        | GI.                 |           |          |                  | 20:007    |
| Napthalene   |        | NN                  |           |        | S                   |           |          |                  | 0.80      |
| m&p-Creosol  |        | SZ                  |           |        | NS                  |           |          |                  | 35.00     |
| Creosol  |        | SN                  |           |        | NS                  |           |          |                  | 350.00    |
| Phenathrena  |        | NZ.                 |           |        | S.Z.                |           |          |                  | 10.00     |
|  |        | Mo                  |           |        | MIC                 |           |          |                  | 10.00     |
| rnenol   |        | GN.                 |           |        | ON!                 |           |          |                  | 10.00     |
| Рутепе   |        | N<br>N              |           |        | n<br>Z              |           |          |                  | 710.00    |
|  |        |                     |           |        |                     |           |          |                  |           |
| Herbicides/Pesticides  | /gn    | ND/NS               |           | /an    | ND/NS               |           | l/gu     | /an              | l/gu      |
| Aloha BHO  |        | NG                  |           |        | SN.                 |           |          |                  | 0.05      |
| Dita-Dita  |        | 200                 |           |        | 214                 |           | 00.0     |                  | 20.0      |
| Endrin   |        | Z.                  |           |        | Na                  |           | 7.00     |                  |           |
| Dieldrin   |        | NS                  |           |        | NS                  |           |          |                  | 0.10      |
| Dimethoate   |        | NS                  |           |        | NS                  |           |          |                  | 5.00      |
| ienlfoton  |        | o'Z                 |           |        | S.Z                 |           |          |                  | 05.0      |
| il maintenance   |        | 2                   |           |        | 201                 |           |          |                  |           |
| 4,5-1  |        | N.                  |           |        | Na                  |           |          |                  | 00.07     |
| 2,4-D  |        | SZ                  |           |        | NS                  |           | 70.00    |                  |           |
| xCDD   |        | SN                  |           |        | SN                  |           |          |                  |           |
| מיטוני   |        | 82                  |           |        | SN.                 |           |          |                  |           |
| VCDr.  |        | CAT                 |           |        | 2                   |           |          |                  |           |
|  | ,      |                     |           | ,      |                     |           |          |                  |           |
| Heavy Metals   | ng/    | ND/NS               |           | ng/l   | SN/QN               |           | l/gn     | ng/l             | ng/l      |
| Antimony   |        | NS                  |           |        | NS                  |           | 6.00     |                  |           |
| Arsenic  |        | Ω                   |           |        | ND                  |           | 50.00    |                  |           |
| Barinn   | 90 00  |                     |           | 100.00 |                     |           | 2000.00  |                  |           |
| - density  | 10.00  |                     |           |        | CIN                 |           | 00       |                  |           |
| Caminum  | 10.00  | 4                   |           |        |                     |           | 0000     |                  |           |
| Chromum  |        | Q.                  |           |        | QN.                 |           | 100.00   |                  |           |
| Copper   | 20.00  |                     |           | 30.00  |                     |           | 1000.00  |                  |           |
| Lead   | 40.00  |                     |           | 40.00  |                     |           | 15.00    |                  |           |
| Mercury  |        | ΩN                  |           |        | QN                  |           | 2.00     |                  |           |
| Nickel   | 50.00  |                     |           |        | SN                  |           | 100.00   |                  |           |
| Calemium<br>Calemium   |        | ď                   |           |        | CZ                  |           | \$0.00   |                  |           |
| TOTAL THE PARTY OF |        |                     |           |        | 912                 |           |          | 00000            |           |
| Silver   |        | Q.                  |           |        | Q.                  |           |          | 100.00           |           |
| Thallium   |        | Z                   |           |        | Z Z                 |           | 7.00     |                  |           |
| Vanadiun   |        | NS                  |           |        | SN                  |           |          |                  | 49.00     |
| Zinc   | 70.00  |                     |           |        | NS                  |           |          | 5000.00          |           |
|  |        |                     |           |        |                     |           |          |                  |           |
| Description of the second  | 11     | ND/MC               |           | Desire | NUMBER OF STREET    |           | 1/2000   | Danne            | 9-11      |
| - Danie at Line and a state of   | 1/8/11 | ND/NS               |           | l/gm   | NUMBER              |           | 2        | 1/40 000         | -         |

| Mercury                        |        | QN    |        | NΩ    | 2.00   |          |       |
|--------------------------------|--------|-------|--------|-------|--------|----------|-------|
| Nickel                         | \$0.00 |       |        | SN    | 100.00 |          |       |
| Seleniun                       |        | QN    |        | QN    | 50.00  |          |       |
| Silver                         |        | QN    |        | QN    |        | 100.00   |       |
| Thallium                       |        | SN    |        | SN    | 2.00   |          |       |
| Vanadium                       |        | SN    |        | SN    |        |          | 49.00 |
| Zinc                           | 70.00  |       |        | NS    |        | \$000.00 |       |
|                                |        |       |        |       |        |          |       |
| Conventional Parameters        | l/gm   | ND/NS | //2m   | SN/QN | mg/l   | l∕3m     | l∕am  |
| Biological Oxygen Demand       | 40.00  |       | 5.70   |       |        |          |       |
| Chemical Oxygen Demand         | 350.00 |       | 120.00 |       |        |          |       |
| Chlondes                       | 45.00  |       | 00.09  |       |        | 250.00   |       |
| Cyanide                        |        | QN    |        | QN    | 0.20   |          |       |
| Annnonia, Nitrogen             | 1.40   |       | 0.08   |       |        |          |       |
| Organic Nitrogen               | 2.20   |       | 1.80   |       |        |          |       |
| Nitrate                        | 08.0   |       | 0.40   |       | 10.00  |          |       |
| Nitrite                        | 0.05   |       | 0.00   |       | 1.00   |          |       |
| Iron                           | 7.80   |       | 09.9   |       |        | 0.30     |       |
| Oil and Grease                 |        | NS    |        | NS    |        |          |       |
| Hd                             | 9.90   |       | 7.00   |       |        | 5.8-5.9  |       |
| Phenols (Total)                |        | NS    |        | NS    |        |          |       |
| Phosphorus                     |        | NS    |        | NS    |        |          |       |
| Total Suspended Solids         | 440.00 |       | 78.00  |       |        |          |       |
| Total Dissolved Solids         | 440.00 |       | 460.00 |       |        | 200.00   |       |
| Sulfate                        | 64.00  |       | 97.00  |       |        | 250.00   |       |
| Total Organic Carbon           |        | NS    |        | NS    |        |          |       |
| TOC (Duplicate)                |        | NS    |        | NS    |        |          |       |
| Total Organic Halogens         |        | NS    |        | NS    |        |          |       |
| Magnesium                      |        | SN    |        | NS    |        |          |       |
| Mangenese                      | 4.10   |       | 2.80   |       |        | 0.05     |       |
| Potassium                      |        | NS    |        | NS    |        |          |       |
| Sodium                         | 34.00  |       | 32.00  |       | 160.00 |          |       |
| Alkalirúty                     | 190.00 |       |        | NS    |        |          |       |
| Calciun                        |        | NS    |        | NS    |        |          |       |
| Hardness                       | 330.00 |       | 280.00 |       |        |          |       |
| Boron                          |        | NS    |        | NS    |        |          | 0.63  |
| Specific Conductance (unho/cm) | 670.00 |       | 540.00 |       |        |          |       |
|                                |        |       |        |       |        |          |       |

NB - Not Sampled
ND - Not Detected
Det Limit - Sampling Detection Limit
MCL - Maximum Contaminant Level; Enforceable Groundware Standards
NGCL - Maximum Contaminant Level; Enforceable Groundware Standards
SMCL- Secondary Maximum Contaminant Level; Enforceable Groundware Standards
Guidance Conceatantions - Not Enforceable Standards

Table A.23: Characteristics of the Kentucky Site.

LANDFILL:

Kentucky Site

OWNER/OPERATOR:

Waste Management of North America, Inc.

3003 Butterfield Road Oak Brook, IL 60521

LITERATURE SOURCE:

Construction and Demolition Landfill Leachate Characterization

Study

Prepared by Rust Environments & Infrastructure for

WMX Technologies, Inc.

WASTE TYPE:

Construction waste and demolition debris. Includes brick,

concrete, wood, plaster, plumbing fixtures, soil, rock, sawdust, metals, furniture, insulation, roofing materials. Yard waste, tires,

and paper are not accepted.

ACREAGE:

13.5 acres.

YEARS IN SERVICE:

Opened in August 1985 and closed in November 1991.

LINER SYSTEM:

None.

LEACHATE SYSTEM:

None.

LEACHATE SAMPLE:

Leachate sample obtained by digging down 20 feet into the landfill

until liquid was found.

MISCELLANEOUS:

Table A.24: Sampling for the Kentucky Site.

|                            | Result | esult D | Det Limit | Result  | esult D | Det Limit | MCL      | MCL    | Conc     |
|----------------------------|--------|---------|-----------|---------|---------|-----------|----------|--------|----------|
| Volatiles                  | ng/l   | ND/NS   |           | /an     | ND/NS   |           | l/ån     | l de   | 100.00   |
| Acetone                    |        | Q       | 100.00    |         | SN      |           |          |        | 2000     |
| 2-Butanone                 |        | Q       |           |         | NS      |           |          |        | 4200.00  |
| Carbon Disulfide           | 15.00  |         | 5.00      |         | NS      |           |          |        | 00.00/   |
| Chloromethane              | 24.00  |         | 10.00     |         | NS      |           |          |        | 2.70     |
| 1-Dichloroethane           |        | Q       | \$.00     |         | SS      |           |          |        | 30.00    |
| 2-Dichloroethane           | 19.00  |         | 2.00      |         | NS      |           | 3.00     |        |          |
| ,4-Dioxane                 |        | QN      | 10.00     |         | SN      |           |          |        | 2.00     |
| Ethylbenzene               |        | ND      | 5.00      |         | NS      |           |          | 700.00 |          |
| Methyl Ethyl Ketone (MEK)  |        | ΩN      | 100.00    |         | NS      |           |          |        | 4200.00  |
| 4-Methyl-2-Pentanone       |        | QX      | 90.00     |         | NS      |           |          |        |          |
| Mathylana Chlorida         |        | CZ      | 5.00      |         | NS      |           | 5.00     |        |          |
| leury rene Cauchage        |        | CZ.     | \$ 00     |         | NS      |           | 1000.00  |        |          |
| Cincin                     |        | NTO.    |           |         | NZ.     |           | 200.00   |        |          |
| 1,1 Trichloroethane        |        | S. C.   | 38,5      |         | No      |           | 3 00     |        |          |
| Trichloroethylene          |        | Q.      | 3.00      |         | 21.0    |           | 3.00     |        | 2100 00  |
| Frichlorofluoromethane     |        | QN      | 10.00     |         | Z S     |           | 00000    |        | 700.00   |
| Xylenes (Total)            |        | ΩN      | 2.00      |         | SZ      |           | 10000.00 |        |          |
|                            |        |         |           |         |         |           |          |        |          |
| Semi-Volatiles             | ug/l   | ND/NS   |           | ng/l    | ND/NS   |           | /ån      | São .  | l'ân     |
| Acenaphthene               |        | ND      | 49.00     |         | Q.      | 100.00    |          |        | 20.00    |
| Aceforhenone               |        | ND      | 100.00    |         | ND      | 100.00    |          |        | 700.00   |
| Denzene                    |        | QN      |           |         | SN      |           | 1.00     |        |          |
| Control A aid              |        | Ş       |           |         | NS      |           |          |        | 28000.00 |
| Delizon Acid               |        | 2       | 100 00    |         | CZ      | 200 00    |          |        |          |
| Bis(2-Euryinexyl)phinalate |        | Š       | 20.00     |         | 2       | 100 00    |          |        | 400 00   |
| 2,4-Dimethylphenol         |        | ON.     | 100.00    |         | 2 4     | 200.001   |          |        | 2000     |
| Di-n-Butyl phthalate       |        | QN      | 100.00    |         | O.Z.    | 100.00    |          |        | 2000     |
| Diethyl Phthalate          |        | ND      | 100.00    |         | Q       | 100.00    |          |        | 2000.00  |
| Fluoranthene               |        | ND      | 100.00    | 180.00  |         | 100.00    |          |        | 280.00   |
| Nanthalene                 |        | ND      | 100.00    | 130.00  |         | 100.00    |          |        | 98.9     |
| m. kn. Transol             |        | QN      | 100.00    |         | ND      | 100.00    |          |        | 35.00    |
| Change                     |        | CZ      | 100 00    |         | QN      | 100.00    |          |        | 350.00   |
| orcional.                  |        | QN.     | 100 00    | 300 00  |         | 100.00    |          |        | 10.00    |
| Phenaurene                 |        | 9       | 00 001    |         | CN      | 00 001    |          |        | 10.00    |
| Phenol                     |        | Q.      | 00.001    | 00.001  | 2       | 100.001   |          |        | 210.00   |
| Pyrene                     |        | Q       | 100.00    | 190.061 |         | 100.00    |          |        | 2        |
|                            |        |         |           |         | 0.00    |           |          | 9      | 000      |
| Herbicides/Pesticides      | ıg/l   | ND/NS   |           | /ån     | ND/NS   | -         | 100      | n/B/I  | â        |
| Alpha-BHC                  |        | ΩN      | 0.01      |         | S       | 0.10      |          |        | 0.03     |
| Endrin                     |        | ΩN      | 10.0      |         | ND      | 0.10      | 2.00     |        |          |
| Dieldrin                   |        | ΩN      | 0.01      | 0.20    |         | 0.10      |          |        | 0.10     |
| himself ont                |        | CZ      | 1 90      |         | QN      | 100.00    |          |        | 2.00     |
| Differentiate              |        | 2       | 001       |         | S       | 100.00    |          |        | 0.50     |
| Disulfoton                 |        |         | 9         |         | 2       | 00.1      |          |        | 70.00    |
| 2,4,5-T                    |        | CZ.     | 0.19      |         | 2       | 3         | 00.01    |        |          |
| 2,4-D                      |        | QN      | 1.20      |         | ON I    | 30.1      | 70.00    |        |          |
| HxCDD                      |        | ND      | 2.30      |         | QN      | 320.00    |          |        |          |
| HxCDF                      |        | ND      | 1.80      |         | 딮       | 210.00    |          |        |          |
|                            |        |         |           |         |         |           | \        |        |          |
| Heavy Metals               | l/an   | ND/NS   |           | /ån     | ND/NS   |           | l/gu     | /an    | ng/      |
| Antimona                   | ,      | QN      | 7.00      |         | QN      | 100.00    | 00.9     |        |          |
| diminary.                  | 12.00  |         | 4 00      | 41 30   |         | 10.00     | 50.00    |        |          |
| Arsemo                     | 0.12   |         | 90        | 243 00  |         | 00 000    | 00 0006  |        |          |
| Barnum                     | 340.00 | !       | 20.01     | 20.00   | 5       | 9         | 00 >     |        |          |
| Cadmium                    |        | Q       | 0.00      |         | 2       | 30.5      | 20.00    |        |          |
| Chromium                   |        | ND      | 10.00     | 36.60   |         | 10.00     | 100.00   |        |          |
| Copper                     |        | ND      | 20.00     | 155.00  |         | 25.00     | 1000.00  |        |          |
| ead                        | 220.00 |         | 15.00     | 1470.00 |         | 250.00    | 15.00    |        |          |
| Mercury                    |        | QN      | 0.20      |         | QN      | 0.20      | 2.00     |        |          |
| Vickel                     | 23.00  | L       | 20.00     | 46.90   |         | 40.00     | 100.00   |        |          |
| Salanina                   |        | GN      | 2.00      |         | £       | 5.00      | \$0.00   |        |          |
|                            |        | SZ.     |           |         | SN      |           |          | 100.00 |          |
| DAILS:                     |        | 2       | 900       |         | CZ      | 10.00     | 2.00     |        | L        |
| namun                      |        | C Z     | 20.00     |         | CZ      | 20 00     |          |        | 49.00    |
| Vanadium                   |        | ON.     | 20.00     |         | 7.7     | 20:00     |          |        |          |
|                            |        |         |           | 00000   |         | 0000      | L        | 0000   |          |

|                                |         | 912   | 00.01 | 07.76   |       | 00 01  | 00 001 |         |       |  |
|--------------------------------|---------|-------|-------|---------|-------|--------|--------|---------|-------|--|
| Cincaman                       |         |       | 00.00 | 2000    |       | 20.00  | 2000   |         |       |  |
| I wad                          | 220.00  |       | 15.00 | 1470.00 |       | 250.00 | 15.00  |         |       |  |
| Mercury                        |         | Q     | 0.20  | 200     | QN    | 0.20   | 2.00   |         |       |  |
| Nickel                         | 23.00   |       | 20.00 | 46.90   |       | 40.00  | 100.00 |         |       |  |
| Selenium                       |         | ΔN    | 5.00  |         | ND    | 5.00   | 20.00  |         |       |  |
| Silver                         |         | SN    |       |         | NS    |        |        | 100.00  |       |  |
| Thalliun                       |         | ΩN    | 5.00  |         | ND    | 10.00  | 2.00   |         |       |  |
| Vanadiun                       |         | ND    | 20.00 |         | ΩN    | \$0.00 |        |         | 49.00 |  |
| Zinc                           | 810.00  |       | 20.00 | 2320.00 |       | 20.00  |        | 5000.00 |       |  |
|                                |         |       |       |         |       |        |        |         |       |  |
| Conventional Parameters        | mg/l    | ND/NS |       | l∕gm    | ND/NS |        | I/am   | l/gm    | l/Bm  |  |
| Biological Oxygen Demand       | 14.00   |       | 1.00  |         | NS    |        |        |         |       |  |
| Chemical Oxygen Demand         | 180.00  |       | 00:09 | 199.00  |       | 10.00  |        |         |       |  |
| Chlorides                      | 180.00  |       | 2.60  | 44.40   |       | 0.50   |        | 250.00  |       |  |
| Cyanide                        | 0.01    |       | 0.01  |         | ND    | 0.02   | 0.20   |         |       |  |
| Ammonia, Nitrogen              | 44.00   |       | 0.52  | 7.51    |       | 0.10   |        |         |       |  |
| Organic Nitrogen               |         | SN    |       |         | NS    |        |        |         |       |  |
| Nitrate                        |         | SN    |       |         | SN    |        | 10.00  |         |       |  |
| Nitrite                        |         | SN    |       |         | NS    |        | 1.00   |         |       |  |
| Iron                           | 26.00   |       | . 04  | 48.60   |       | 0.10   |        | 0.30    |       |  |
| Oil and Grease                 | 1.00    |       | 0.26  | 18.20   |       | 1.00   |        |         |       |  |
| Hd                             | 6.80    |       |       | 6.83    |       |        |        | 6.5-8.5 |       |  |
| Phenols (Total)                |         | ΩN    | 0.01  | 0.01    |       | 0.01   |        |         |       |  |
| Phosphorus                     | 1.00    |       | 0.06  | 98.0    |       | 0.20   |        |         |       |  |
| Total Suspended Solids         | 390.00  |       | 10.00 | 934.00  |       | 3.00   |        |         |       |  |
| Total Dissolved Solids         | 1200.00 |       | 10.00 | 1010.00 |       | 5.00   |        | \$00.00 |       |  |
| Sulfate                        | 15.00   |       | 0.05  | 241.00  |       | 5.00   |        | 250.00  |       |  |
| Total Organic Carbon           | 52.00   |       | 1.00  | 33.00   |       | 1.00   |        |         |       |  |
| TOC (Duplicate)                | 52.00   |       | 1.00  | 33.30   |       | 1.00   |        |         |       |  |
| Total Organic Halogens         | 0.86    |       | 0.01  | 0.03    |       | 0.01   |        |         |       |  |
| Magnesiun                      |         | SN    |       |         | NS    |        |        |         |       |  |
| Mangenese                      |         | SN    |       |         | NS    |        |        | 0.05    |       |  |
| Potassium                      |         | NS    |       |         | NS    |        |        |         |       |  |
| Sodium                         |         | SN    |       |         | NS    |        | 160.00 |         |       |  |
| Alkalinity                     |         | SN    |       |         | NS    |        |        |         |       |  |
| Calcium                        |         | SN    |       |         | NS    |        |        |         |       |  |
| Hardness                       |         | SN    |       |         | NS    |        |        |         |       |  |
| Boron                          |         | SN    |       |         | NS    |        |        |         | 0.63  |  |
| Specific Conductance (unho/cm) |         | NS    |       |         | NS    |        |        |         |       |  |
|                                |         |       |       |         |       |        |        |         |       |  |

NS - Not Sampled
ND - Not Detected
Det Limit - Sampling Detection Limit
Det Limit - Sampling Detection Limit
MCL - Maximum Contaminant Level; Enforceable Groundwater Standards
MCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards
Guidence Concentrations - Not Enforceable Standards

Table A.25: Characteristics of the Massachusetts Site.

LANDFILL:

Massachusetts Site

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

Construction and Demolition Landfill Leachate Characterization

Study

Prepared by Rust Environments & Infrastructure for

WMX Technologies, Inc.

WASTE TYPE:

Construction waste and demolition debris. Includes wood, plaster,

roofing materials, fencing, telephone poles, tires, and appliances.

Does not accept special waste such as asbestos.

ACREAGE:

4 acres.

YEARS IN SERVICE:

Opened in November 1989.

LINER SYSTEM:

60-mil HDPE liner.

LEACHATE SYSTEM:

Yes.

LEACHATE SAMPLE:

Leachate sample taken from a composite of two leachate tanks

which drain the three active landfill cells.

MISCELLANEOUS:

Waste Management reported the analytical results from this landfill,

but did not identify the location or the owner/operators of the

landfill.

Table A.26: Sampling for the Massachusetts Site.

|                            | Res      | 1991 Sampling<br>Result D | 1g<br>Det Limit | 1992<br>Result | 1992 Sampling | ng<br>Det Limit | 1.<br>Red | 1993 Sampling<br>Result | ng<br>Det Limit | Primary<br>MCL | Secondary<br>MCL | Guidance<br>Conc |
|----------------------------|----------|---------------------------|-----------------|----------------|---------------|-----------------|-----------|-------------------------|-----------------|----------------|------------------|------------------|
| olatiles                   | l/an     | ND/NS                     |                 | ön             | ND/NS         |                 | 1/dn      | ND/NS                   |                 | l/gu           | [∕ðn             | 1/an             |
| Cetone                     | 5100.00  |                           | 250.00          |                | ND            | 00.089          | 41.00     |                         | 10.00           |                |                  | 700.00           |
| -Butanone                  | 2500.00  |                           | 250.00          |                | ND            |                 |           | QN                      |                 |                |                  | 4200.00          |
| Carbon Disulfide           |          | ND                        | 12.00           |                | ND            | 100.00          |           | QN                      | 8.00            |                |                  | 700.00           |
| Clyoromethane              | 43.00    |                           | 25.00           |                | S             | 200.00          |           | ND                      | 10.00           |                |                  | 2.70             |
| , I-Dichloroethane         | 48.00    |                           | 12.00           |                | S             | 100.00          |           | QN                      | 2.00            |                |                  | 700.00           |
| 1,2-Dichloroethane         | 26.00    |                           | 12.00           |                | QN !          | 100.00          |           | QN<br>N                 | 3.00            | 3.00           |                  | 3                |
| ,4-Dioxane                 | 00.00    | QN                        | 10.00           |                | 2             | 00 00           | 49.00     |                         | 20.00           |                | 100.00           | 2.00             |
| Ethylbenzene               | 18.00    |                           | 250.00          | 300.00         | ND.           | 200.00          | 8         | CN.                     | 10.00           |                | 700.00           | 4200 00          |
| Memyl Emyl Ketone (MEK)    | 250.00   |                           | 120.00          | 330.00         | CN            | 200.00          |           | Z CZ                    | 10.00           |                |                  | 20000            |
| -Mediations Obligated      | 60 00    |                           | 12.00           |                | 2             | 100 00          |           | Ę                       | 9               | 2.00           |                  |                  |
| Activiene Cinoline         | 240.00   |                           | 12.00           | 290.00         | 2             | 100 00          |           | Q Z                     | 2.00            | 1000.00        |                  |                  |
| 1 1 Trichloroethane        |          | SZ                        |                 |                | NS            |                 |           | SN                      |                 | 200.00         |                  |                  |
| Fichloroethylene           | 20.00    |                           | 12.00           |                | QN            | 100.00          |           | ND                      | 5.00            | 3.00           |                  |                  |
| Cichlorofluoromethane      |          | CZ                        | 25 00           |                | S             | 100.00          |           | QN                      | 10.00           |                |                  | 2100.00          |
| (Venes (Total)             | 85.00    |                           | 12.00           | 120.00         |               | 100.00          | 4.00      |                         | 5.00            | 10000.00       |                  |                  |
| ,                          |          |                           |                 |                |               |                 |           |                         |                 |                |                  |                  |
| Semi-Volatiles             | 1/dn     | SN/QN                     |                 | [/Sn           | ND/NS         |                 | Én        | ND/NS                   |                 | l/gu           | l∕gu             | l/ån             |
| Acenaphthene               |          | QN                        | 47.00           |                | ND            | 100 00          |           | ND                      | 10.00           |                |                  | 20.00            |
| Acetophenone               |          | ON                        | 47.00           |                | QN            | 100.00          | 2.00      |                         | 10.00           |                |                  | 700.00           |
| Senzene                    |          | QN                        | 12.00           |                | ND            | 5.00            |           | ΩN                      | 2.00            | 1.00           |                  |                  |
| Benzoic Acid               | 53000.00 | ΩN                        | 240.00          |                | NS            |                 |           | ND                      | 20.00           |                |                  | 28000.00         |
| Bis(2-Ethylhexyl)phthalate |          | ND                        | 47.00           |                | ND            | 200.00          |           | Q.                      | 10.00           |                |                  |                  |
| 2,4-Dimethylphenol         |          | ON                        | 47.00           |                | ND            | 100.00          |           | Ð                       | 10.00           |                |                  | 400.00           |
| Di-n-Butyl phthalate       |          | ND                        | 47.00           |                | ND            | 100.00          |           | Ω                       | 10.00           |                |                  | 700.00           |
| Diethyl Phthalate          |          | ΩN                        | 47.00           |                | ΩN            | 100.00          | 1.00      |                         | 10.00           |                |                  | \$600.00         |
| Huoranthene                |          | QN                        | 47.00           |                | ΩN            | 100.00          |           | 2                       | 10.00           |                |                  | 280.00           |
| Vapthalene                 | 63.00    |                           | 47.00           |                | QN            | 100.00          |           | Q !                     | 10.00           |                |                  | 0.80             |
| n&p-Creosol                | 5700.00  |                           | 47.00           | 9700.00        | 4             | 100.00          |           | 2 2                     | 10.00           |                |                  | 35.00            |
| o-Creosol                  | 04.00    |                           | 47.00           |                | 2             | 100.00          | 5         | Q.                      | 00.01           |                |                  | 10.00            |
| Phenathrene                | 1000 000 | 2 2                       | 47.00           | 00 010         | ND            | 100.00          | 3.6       | 5                       | 10.00           |                |                  | 10.00            |
| Tienoi                     | 1900.00  |                           | 47.00           | 70.017         | ND.           | 100.00          |           | 2                       | 10.00           |                |                  | 210.00           |
| rytette                    |          |                           | 8               |                |               | 200             |           |                         |                 |                |                  |                  |
| Herbicides/Pesticides      | l/an     | ND/NS                     |                 | l/gu           | ND/NS         |                 | l/8n      | ND/NS                   |                 | l/ån           | l/ån             | l⁄gu             |
| Alpha-BHC                  | 0.12     |                           | 0.05            |                | QN            | 08.0            |           | QN                      | 0.50            |                |                  | 0.05             |
| Endrin                     |          | QZ                        | 0.05            |                | ND            | 08.0            |           | QN                      | 0.99            | 2.00           |                  |                  |
| Dieldrin                   | 0.07     |                           | 0.05            |                | ΩN            | 08.0            |           | QN                      | 0.50            |                |                  | 0.10             |
| Dinethoate                 |          | QN                        | 1.90            |                | ND            | 100.00          | 2.70      |                         | 1.90            |                |                  | 2.00             |
| Jisulfoton                 |          | ND                        | 1.90            |                | ΩN            | 100.00          | 5.60      |                         | 1.50            |                |                  | 0.50             |
| 2,4,5-T                    | 0.53     |                           | 0.19            |                | ND            | 2.00            |           | Ð                       | 4.70            |                |                  | 70.00            |
| ,4-D                       |          | Q                         | 1.10            |                | ND            | 2.00            |           | Q                       | 4.70            | 70.00          |                  |                  |
| НхСDD                      |          | Q                         | 2.00            |                | QN            | 360.00          |           | 2                       | 1.80            |                |                  |                  |
| HxCDF                      |          | QN                        | 1.10            |                | Q             | 210.00          |           | QN                      | 1.40            |                |                  |                  |
| Jean Meinle                | 1/011    | ND/NS                     |                 | l/an           | SN/QN         |                 | l/an      | ND/NS                   |                 | /an            | /an              | l/dn             |
| Antimony                   |          | QN                        | 7.00            |                | ND            | 500.00          |           | Q                       | 100.00          | 9.00           |                  |                  |
| Arsenic                    | 33.00    |                           | 4.00            |                | ND            | 35.00           | 15.00     |                         | 30.00           | \$0.00         |                  |                  |
| karium                     | 500.00   |                           | 10.00           | 368.00         |               | 200.00          | 200.00    |                         | 20.00           | 2000.00        |                  |                  |
| Cadmun                     |          | ΩN                        | 20.00           |                | QN            | 2.00            |           | Q                       | 10.00           | 2.00           |                  |                  |
| Chromium                   | 45.00    |                           | 10.00           |                | Q.            | 50.00           |           | Q S                     | 20.00           | 00.00          |                  |                  |
| Copper                     | 3        | QN                        | 80.00           |                | 2 5           | 125.00          |           | 2 2                     | 20.00           | 14.00          |                  |                  |
| read                       | 13.00    | 2                         | 00.00           |                | S S           | 0.50            |           | S                       | 0.20            | 200            |                  |                  |
| lickel                     |          | S                         | 80.00           |                | ND            | 200.00          |           | £                       | 20.00           | 100.00         |                  |                  |
| Selenum                    |          | ą                         | 5.00            |                | ND            | 5.00            |           | QN                      | 2.00            | \$0.00         |                  |                  |
| Silver                     |          | NS                        |                 |                | NS            |                 |           | NS                      |                 |                | 100.00           |                  |
| Thallium                   |          | ΩN                        | 5.00            |                | Q.            | 10.00           |           | 2                       | \$00.00         | 2.00           |                  | 8                |
| Vanadium                   | 96.00    |                           | 20.00           | 40.65          | Q.            | 20.00           | 13.00     | Q.                      | 10.00           |                | \$000.00         | 43.00            |
| anc.                       | 300.00   |                           | 90.00           | /8.30          |               | 70.00           | 13.00     |                         | 2               |                | 2000             |                  |
| Conventional Parameters    | mg/l     | ND/NS                     |                 | l/gm           | ND/NS         |                 | l/gim     | ND/NS                   |                 | l/gm           | mg/l             | l/gm             |
|                            | 110.00   |                           | 1 00            |                | SZ            |                 | 27.00     |                         | 2.00            |                |                  |                  |

|   |         | 1     | W. W.  |         | LID.  | 00.5   |         | CIN!  | 20:01   | 00'6    |          |       | ١ |
|---|---------|-------|--------|---------|-------|--------|---------|-------|---------|---------|----------|-------|---|
| Cadmunn   | 00 91   | 2     | 1000   |         | CZ    | \$0.00 |         | QN    | 20.00   | 100.00  |          |       |   |
| Chromium  | 45.00   |       | 10.00  |         |       | 126 00 |         | CZ    | 20.00   | 1000.00 |          |       |   |
| Copper  |         | QN    | 80.00  |         | Q.    | 00.671 |         |       | 00.03   | 15.00   |          |       |   |
| Lead  | 13.00   |       | 3.00   |         | QN    | 25.00  |         | Q.    | 20.00   | 00.01   |          |       |   |
| Merciny   |         | ΔN    | 0.20   |         | ND    | 0.20   |         | 2     | 0.20    | 2.00    |          |       |   |
| Niobal  |         | ND    | 80.00  |         | QN.   | 200.00 |         | ΩN    | 20.00   | 100.00  |          |       |   |
| Calanium  |         | QN    | 5.00   |         | S     | 5.00   |         | ND    | 2.00    | 20.00   |          |       |   |
| Silver  |         | SZ    |        |         | NS    |        |         | SN    |         |         | 100.00   |       |   |
| Silver<br>Fr. 11:   |         | CZ    | 2 00   |         | S     | 10.00  |         | QN    | \$00.00 | 2.00    |          |       |   |
| I namum   | 00,00   |       | 20.00  |         | N     | \$0.00 |         | ND    | 10.00   |         |          | 49.00 |   |
| Vansdum   | 30000   |       | 80.00  | 78.50   |       | 20.00  | 13.00   |       | 10.00   |         | \$000.00 |       |   |
| Zuc   | 300.00  |       | 200    |         |       |        |         |       |         |         |          |       |   |
| O To the second | Moral   | SN/QN |        | l/dm    | ND/NS |        | l/gm    | ND/NS |         | mg/l    | mg/l     | mg/l  |   |
| Convenient i maneres  | 110.00  |       | 90     |         | NS    |        | 27.00   |       | 2.00    |         |          |       |   |
| Biological Oxygen Deniand   | 4700.00 |       | 200.00 | 1690 00 |       | 200.00 | 420.00  |       | \$0.00  |         |          |       |   |
| Chemical Oxygen Demand  | 410.00  |       | 1 00   | 493.00  |       | 2.50   | 200.00  |       | 20.00   |         | 250.00   |       |   |
| Citionage   | 000     |       | 0.01   |         | Q     | 0.02   |         | QN    | 0.01    | 0.20    |          |       |   |
| A Nitrogen  | 40.00   |       | 8 00   | 42.80   |       | 0.40   | 25.80   |       | 1.00    |         |          |       |   |
| Alfuliolua, Mucgell   | 20.00   | NZ.   |        |         | SN    |        |         | NS    |         |         |          |       |   |
| Organic Nitrogen  |         | 2 2   |        |         | 52    |        |         | NS    |         | 10.00   |          |       |   |
| Nitrate   |         | o A   |        |         | NA    |        |         | NS    |         | 1.00    |          |       |   |
| Nitrite   |         | 2     |        | 00 11   |       | 900    | 14 00   |       | 0.03    |         | 0.30     |       |   |
| Iron  | 27.00   |       | 0.04   | 44.80   | 9     | 00.00  | 24.00   | 2     | 9       |         |          |       |   |
| Oil and Grease  | 26.00   |       | 0.48   |         | QN.   | 2.30   | 3       | 2     | 8       |         | 3033     |       |   |
| Hd  | 6.60    |       |        | 7.18    |       |        | 7.20    |       |         |         | 0.5-6.5  |       |   |
| Phenols (Total)   | 4.90    |       | 0.20   | 1.75    |       | 0.05   | 0.04    |       | 0.0     |         |          |       |   |
| Phospherus  | 1.60    |       | 0.10   | 1.42    |       | 0.20   | 0.21    |       | 0.05    |         |          |       |   |
| Total Suspended Solids  | 91.00   |       | 10.00  | 78.00   |       | 3.00   | 44.00   |       | 2.00    |         |          |       |   |
| Total Dissolved Solids  | 6500.00 |       | 9.00   | 4710.00 |       | 5.00   | 1800.00 |       | 10.00   |         | 200.00   |       |   |
| Sulfate   | 21.00   |       | 0.05   | 112.00  |       | 20.00  | 18.90   |       | 10.00   |         | 250.00   |       |   |
| Total Organic Carbon  | 2100.00 |       | 30.00  | 550.00  |       | 10.00  | 128.00  |       | 10.00   |         |          |       |   |
| TOC (Duplicate)   | 1900.00 |       | 30.00  | 529.00  |       | 10.00  | 128.00  |       | 10.00   |         |          |       |   |
| Total Organic Halogens  | 0.91    |       | 0.01   | 0.59    |       | 0.01   | 0.32    |       | 0.01    |         |          |       |   |
| Magnesium   |         | NS    |        |         | NS    |        |         | SS    |         |         | 3        |       |   |
| Mangenese   |         | NS    |        |         | NS    |        |         | SS    |         |         | 0.00     |       |   |
| Potassium   |         | SN    |        |         | NS    |        |         | SN    |         |         |          |       |   |
| Sodium  |         | SN    |        |         | NS    |        |         | SZ    |         | 160.00  |          |       |   |
| Alkalinity  |         | SN    |        |         | NS    |        |         | SN    |         |         |          |       |   |
| Calciun   |         | SN    |        |         | SN    |        |         | SN    |         |         |          |       |   |
| Hardness  |         | SN    |        |         | SN    |        |         | SZ    |         |         |          |       |   |
| Boron   |         | SN    |        |         | NS    |        |         | SN    |         |         |          | 0.63  |   |
| Specific Conductance (unho/cm)  |         | SS    |        |         | NS    |        |         | SZ    |         |         |          |       |   |
|   |         |       |        |         |       |        |         |       |         |         |          |       |   |

NB - Not Sampled
ND - Not Detected
Det Limit - Sampling Detection Limit
MCL - Maximum Contaminat Level; Efforcable Groundwater Standards
MCL - Assimum Contaminat Level; Efforcable Groundwater Standards
Guidance Contentrations Not Efforcable Standards

Table A.27: Characteristics of the Michigan Site.

LANDFILL:

Michigan Site

OWNER/OPERATOR:

Waste Management of North America, Inc.

3003 Butterfield Road Oak Brook, IL 60521

LITERATURE SOURCE:

Construction and Demolition Landfill Leachate Characterization

Study

Prepared by Rust Environments & Infrastructure for

WMX Technologies, Inc.

WASTE TYPE:

Construction waste and demolition debris. Includes concrete,

brick, wooden pallets, and brush. Does not accept white goods or

tires.

ACREAGE:

2 acres.

YEARS IN SERVICE:

Opened in June 1990.

LINER SYSTEM:

30-mil PVC liner.

LEACHATE SYSTEM:

Yes.

LEACHATE SAMPLE:

Leachate sample taken from a leachate manhole in the C&D portion

of the landfill.

MISCELLANEOUS:

Table A.28: Sampling for the Michigan Site.

| Polanties  |  | 100.00<br>100.00<br>100.00<br>5.00<br>5.00<br>5.00<br>5.00   |              | SN CN | 34     | 026   | ND/NS  | 100.00  | Vân   | L/Sn  | <b>ug/l</b><br>700<br>4200 |
|--|--|--|--------------|---|--------|-------|--------|---------|-------|-------|----------------------------|
| 15K) 160 160 160 190 190 190   | <del>┦┤┦┦┦┼┦┦╎┧┩┪┩╎┧╏┩┦┞╏┼┼╇╃┞┞</del>            | 100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>100.00<br>10 |              | 2222                                      | 34     | 970   |        | 100.00  |       |       | 700                        |
| SK) 5500 190 190 190 190 190 190 190 190 190 1   |  | 5 00<br>5 00<br>6 00<br>6 00<br>7 00<br>7 00<br>8 00<br>8 00<br>8 00<br>9 00   |              | 222                                       | 5      |       |        |         |       |       | 4200                       |
| 13 9.2 6.6 6.7 1.3 1.3 1.90 1.90 1.90 1.90 1.90 1.90 1.90 1.90   |  | 5.00<br>10.00<br>5.00<br>10.00<br>10.00<br>5.00<br>5.00<br>5.  |              | 22  | •      |       | QN     |         |       |       |                            |
| 3K) 6 6 6 8 9 2 9 2 9 2 9 2 9 2 9 2 9 2 9 2 9 2 9  |  | 5.00<br>5.00<br>10.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00  |              | 2   | 00.5   | 14    |        | \$ 00   |       |       | 700                        |
| SK) 6 6 6 5500 5500 5500 190 190 190   |  | 5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00   |              |   | 10.00  |       | CZ     | 10.00   |       |       | 3                          |
| 3K) 6 6 6 6 13 13 190 190 190 190 190  |  | 5.00<br>10.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00  |              | 5   |        | 4     |        | 2 00    |       |       | 90,                        |
| 5K) 6 6 6 6 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9  |  | 5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00   |              | 5   | -      |       | CN     | 00.5    |       |       |                            |
| 5K) 6 6 6 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9  |  | 5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00   |              | 2   | 1      |       | 2      | 20.00   |       |       | ~                          |
| 5K) 6 6 6 8 13 13 13 190 190 190 190 190   |  | 5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00   |              |   |        |       | 1      | 900     |       | 200   |                            |
| 13 13 190 190 190 190 190 190 190 190 190 190  |  | 100.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00   |              | Q.  |        | 200   | ON.    | 20.00   |       |       | 7300                       |
| 13 13 190 190 190 190 190 190 190 190 190 190  |  | \$0.00<br>\$.00<br>\$.00<br>\$.00<br>\$.00<br>\$.00<br>\$.00<br>\$.0   |              | 2   | 2      | 470   |        | 100.00  |       |       | 4700                       |
| 13 13 150 150 150 150 150 150 150 150 150 150  |  | 5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00<br>5.00   |              | Q   | 2      |       | Q<br>N | 10.00   |       |       |                            |
| 13 13 1500 1500 1500 1500 1500 1500 1500   |  | 5.00<br>10.00<br>5.00<br>5.00<br>5.00<br>48.00<br>5.00<br>5.00<br>5.00   |              | QN  | 5      | 7     |        | 5.00    | \$    |       |                            |
| 13 13 1500 5500 190 190 190 190 190 190 190 190 190 1  |  | 5.00<br>5.00<br>5.00<br>5.00<br>48.00<br>48.00<br>5.00   |              | Q.  | ~      | 110   |        | 9.00    | 1000  |       |                            |
| 13 ug/l 190 190 190  | <del>                                     </del> | 5.00<br>10.00<br>5.00<br>5.00<br>48.00<br>48.00<br>5.00<br>5.00  |              | SN<br>SN                                  |        |       | SZ     |         | 200   |       |                            |
| 13 190 190 190 190 190 190 190 190 190 190   |  | 5.00<br>5.00<br>5.00<br>5.00<br>5.00   | 1            | 2   | -      |       | 5      | 90 \$   |       |       |                            |
| 13 ug/l 190 l90 l90 l90 l90 l90 l90 l90 l90 l90 l  |  | 5.00<br>5.00<br>48.00<br>5.00<br>5.00  |              | 2 !                                       |        | I     | 2      | 3       | 1     |       | 100                        |
| 1900 S5000 and 1900 a | <del></del>                                      | 5.00<br>48.00<br>5.00<br>240.00  |              | 2   | 01     |       | 2      | 00.00   |       |       | 7100                       |
| 1900 1900 1900 1900 1900 1900 1900 1900  |  | 48.00<br>48.00<br>5.00<br>240.00   |              | Ð   | 2      | 2     |        | 2.00    | 10000 |       |                            |
| 190    |  | 48.00<br>5.00<br>240.00  |              |   |        |       |        |         |       |       |                            |
| 5500<br>190  | <del>                                     </del> | 48.00<br>48.00<br>5.00<br>240.00   | /an          | ND/NS                                     |        | ng/l  | ND/NS  |         | ng/l  | l/ån  | 'agu                       |
| 5500<br>190<br>190   |  | 5.00   |              | £   | 10.00  |       | QN     | 10.00   |       |       | 20                         |
| 9500<br>190  |  | 5.00   |              | QN  | 10.00  |       | Q      | 10.00   |       |       | 200                        |
| 190 lb0 lb0 lb0 lb0 lb0 lb0 lb0 lb0 lb0 lb   |  | 240.00   |              | S   | \$ 00  |       | QN     | 5.00    | -     |       |                            |
| 190 I I I I I I I I I I I I I I I I I I I  | ++++++++++++++++++++++++++++++++++++             | 240.00   |              | No  |        | 11000 |        | \$00.00 |       |       | 28000                      |
| 1900 1900  |  |  |              | 2 5                                       | 00 03  | 11000 |        | 10.00   |       |       |                            |
| 1900 I 1900 II | ++++   | 48.00  |              |   | 20.00  | ,     |        | 10.00   |       |       | SOF                        |
| 190 III III III III III III III III III I  |  | 48.00  |              | Q.  | 10.00  |       | 9.     | 10.00   |       |       | 9                          |
| late 190 setticides ug/l   | +++  | 48.00  |              | 2   | 10.00  |       | 2      | 10.00   |       |       | 3                          |
| 190 and a negal  | +  | 48.00  |              | 2   | 10.00  | -     |        | 10.00   |       |       | NOC O                      |
| 190 esticides ugil   | +  | 48.00  |              | Q   | 10.00  | 1     | Q      | 10.00   |       |       | 707                        |
| 190 esticides ugil   |  | 48.00  |              | Q.  | 10.00  | 8     |        | 10.00   |       |       | - :                        |
| esticides ug/l   | -  | 48.00  |              | Q   | 10.00  | 1100  |        | 100.00  |       |       | 3                          |
| esticides ug/l   | Ω  | 48.00  |              | Ω   | 10.00  |       | 2      | 10.00   |       |       | OCE :                      |
| esticides ug/l   |  | 48.00  |              | Q   | 10.00  |       | Q      | 10.00   |       |       | 2                          |
| des/Pesticides ugil  |  | 48.00  |              | ND  | 10.00  | 22    |        | 10.00   |       |       | 2                          |
| ugl<br>des/Pesticides ugl  | Н  | 48.00  |              | Q   | 10.00  |       | Q      | 10.00   |       |       | 210                        |
| des Pesticides ugl   | L  |  |              |   |        |       |        |         |       |       |                            |
| ЭНС  | ND/NS  |  | ng/l         | ND/NS                                     |        | ng∕l  | ND/NS  |         | San   | /an   | /ån                        |
|  | L  | 0.940  |              | QN  | 0.40   |       | R      | 0.26    |       |       | 0.05                       |
|  | Q.   | 0.940  |              | ĐŽ  | 0.40   |       | S      | 0.51    | 2.0   |       |                            |
|  | ╁  | 0 640  |              | Q   | 0.40   |       | QN     | 0.51    |       |       | 0.10                       |
| Designi  | +  | 700  |              | S   | 10 00  |       | Q      | 2.50    |       |       | s                          |
| 300  |  | * 000  | $\dagger$    | 2 5                                       | 10.00  |       | Ę      | 9       |       |       | 0.5                        |
| 0.30   | 4  | 0.74   | $\dagger$    |   | 10.00  |       | 2      | 4.80    |       |       | 70                         |
|  |  | 0.19   | 1            | Z C                                       | 30.    | 5     |        | 7 80    | 70    |       |                            |
| 2,4-D  |  | 01   |              | 2   | 1.00   | 2     |        | 4.00    | 2     |       |                            |
|  | Ω  | 2.70   |              | 2   | 08.00  |       |        | 00.0    |       |       |                            |
|  | Q.   | 1.60   |              | QN  | 53.00  | 1.7   |        | 0/./    |       |       |                            |
|  |  |  | $^{\dagger}$ | 1   |        | 0     | NIN ME |         | 1     | Date. | 1/04                       |
| Heavy Metaks ug/l N  | ND/NS  |  | l/ån         | ND/NS                                     |        | n San | SNIGN  | +       | i de  | - An  | A                          |
| +  | ΩN   | 7.00   |              | QN  | 00:00  |       | 2      | 100.00  | 0 5   |       |                            |
|  |  | 4.00   | 37.6         |   | 10.00  | 92    |        | 10.00   | 30    |       |                            |
| Barium 140   |  | 10.00  |              | Ð   | 200.00 | 210   |        | 20.00   | 2000  |       |                            |
| Cadmium 6.9  |  | 5.00   |              | N   | 5.00   |       | g      | 10.00   | S     |       |                            |
| Chromium   | QN   | 10.00  |              | ND  | 10.00  |       | Q      | 20.00   | 100   |       |                            |
|  | ND   | 20.00  |              | ND  | 25.00  |       | Q      | 20.00   | 1000  |       |                            |
|  | ND   | 3.00   |              | Q   | 5.00   |       |        | 20.00   | 2     |       |                            |
| Mercury  | QN   | 0.20   |              | Q.  | 0.20   |       | Ω      | 0.20    | 2     |       |                            |
|  | ND   | 20.00  |              | R   | 40.00  |       | Ñ      | 20.00   | 8     |       |                            |
| Selenium   | QN   | 5.00   |              | Ð   | 5.00   |       | Q<br>Z | 2000    | 20    |       |                            |
|  | NS   |  |              | SN  |        |       | SZ     |         | 1     | 100   |                            |
|  | Q.   | 2.00   | 1            | Q   | 10.00  |       | 2      | 20.00   | 2     |       | 9                          |
| $\exists$  | Q  | 20.00  | 1            | Ω̈́                                       | 20.00  | 9     |        | 10.00   |       |       | \$                         |
| Zinc 23  |  | 20.00  | 34.8         |   | 20.00  | 38    |        | 10.00   |       | 2000  |                            |
|  |  |  |              |   |        |       |        |         |       |       |                            |

| Arsenic                        | 19   |       | 4.00  | 37.6 |       | 10.00  | 36   |       | 10.00  | 90   |         |      |
|--------------------------------|------|-------|-------|------|-------|--------|------|-------|--------|------|---------|------|
| Barium                         | 140  |       | 10.00 |      | ND    | 200.00 | 810  |       | 50.00  | 2000 |         |      |
| Cadmium                        | 6.9  |       | \$.00 |      | QN    | 5.00   |      | ND    | 10.00  | 5    |         |      |
| Chromium                       |      | Q.    | 10.00 |      | QN    | 10.00  |      | QN    | 20.00  | 100  |         |      |
| Copper                         |      | QN    | 20.00 |      | ND    | 25.00  |      | QN    | 20.00  | 1000 |         |      |
| pead                           |      | QN    | 3.00  |      | ND    | 5.00   |      | ND    | \$0.00 | 15   |         |      |
| Mercury                        |      | QN    | 0.20  |      | ND    | 0.20   |      | ND    | 0.20   | 2    |         |      |
| Nickel                         |      | QN    | 20.00 |      | ND    | 40.00  |      | QN    | 20.00  | 100  |         |      |
| Selenium                       |      | QN    | 5.00  |      | ΩN    | 5.00   |      | ND    | 10.00  | 50   |         |      |
| Silver                         |      | SN    |       |      | SN    |        |      | NS    |        |      | 100     |      |
| Thallium                       |      | QN    | 5.00  |      | ND    | 10.00  |      | ND    | \$0.00 | 2    |         |      |
| Vanadium                       |      | QN    | 20.00 |      | ND    | \$0.00 | 16   |       | 10.00  |      |         | 49   |
| Zinc                           | 23   |       | 20.00 | 34.8 |       | 20.00  | 38   |       | 10.00  |      | \$000   |      |
|                                |      |       |       |      |       |        |      |       |        |      |         | Ţ,   |
| Conventional Parameters        | /Sut | ND/NS |       | mg/l | ND/NS |        | mg/l | ND/NS |        | mg/  | mg/l    | mg/l |
| Biological Oxygen Demand       | 140  |       | 1.00  |      | NS    |        | 920  |       | 2.00   |      |         |      |
| Chemical Oxygen Demand         | 390  |       | 5.00  | 156  |       | 10.00  | 1300 |       | 50.00  |      |         |      |
| Chlorides                      | 51   |       | 0.40  | 48.2 |       | 05'0   | 130  |       | 5.00   |      | 250     |      |
| Cyanide                        | 0.02 |       | 0.01  |      | QN    | 0.02   | 10.0 |       | 0.01   | 0.2  |         |      |
| Amnonia, Nitrogen              | =    |       | 80.0  | 0.74 |       | 0.02   | 5.4  |       | 0.20   |      |         |      |
| Organic Nitrogen               |      | SN    |       |      | NS    |        |      | NS    |        |      |         |      |
| Nitrate                        |      | SN    |       |      | NS    |        |      | NS    |        | 0    |         |      |
| Nitrite                        |      | SN    |       |      | NS    |        |      | SN    |        | -    |         |      |
| ron                            | 1.4  |       | 0.04  | 6.29 |       | 0.10   | 27.6 |       | 0.03   |      | 0.30    |      |
| Oil and Grease                 | 1.1  |       | 0.44  | 4.4  |       | 1.00   | 6    |       | 9.00   |      |         |      |
| Н                              | 7.2  |       |       | 7.15 |       | 0.05   | 6.9  |       |        |      | 6.5-8.5 |      |
| henols (Total)                 | 0.14 |       | 0.01  |      | ND    | 0.01   | 0.35 |       | 0.03   |      |         |      |
| hosphorus                      | 0.1  |       | 0.02  | 0.26 |       | 0.20   | 0.27 |       | 0.05   |      |         |      |
| otal Suspended Solids          |      | ND    | 10.00 | 19   |       | 3.00   | 98   |       | 5.00   |      |         |      |
| otal Dissolved Solids          | 3000 |       | 9.00  | 1760 |       | 5.00   | 2700 |       | 10.00  |      | 200     |      |
| Sulfate                        | 170  |       | 1.00  | 459  |       | 100.00 | 68.3 |       | 25.00  |      | 250     |      |
| Fotal Organic Carbon           | 180  |       | 2.00  | 49.6 |       | 1.00   | 434  |       | \$0.00 |      |         |      |
| roc (Duplicate)                | 170  |       | 2.00  | 48.7 |       | 1.00   | 436  |       | \$0.00 |      |         |      |
| Fotal Organic Halogens         | 0.74 |       | 0.01  | 0.07 |       | 0.01   | 0.14 |       | 0.01   |      |         |      |
| Magnesium                      |      | NS    |       |      | NS    |        |      | SN    |        |      |         |      |
| Mangenese                      |      | SN    |       |      | NS    |        |      | NS    |        |      | 0.050   |      |
| otassium                       |      | NS    |       |      | NS    |        |      | SS    |        |      |         |      |
| Sodium                         |      | SN    |       |      | NS    |        |      | NS    |        | 160  |         |      |
| Alkalinity                     |      | SN    |       |      | NS    |        |      | NS    |        |      |         |      |
| Calcium                        |      | NS    |       |      | NS    |        |      | NS    |        |      |         |      |
| lardness                       |      | NS    |       |      | NS    |        |      | SS    |        |      |         |      |
| Вогоп                          |      | SN    |       |      | NS    |        |      | SZ    |        |      |         | 0.63 |
| Specific Conductance (umbo/cm) |      | SN    |       |      | NS    |        |      | NS    |        |      |         |      |

NB - Not Sampled
ND - Not Detected
Det.Limit - Sampling Detection Limit
MCL - Maximum Contaminant Level; Euforceable Groundwater Standards
MCL - Assimum Contaminant Level; Euforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level; Euforceable Groundwater Standards
Cundoance Concentrations - Not Euforceable Standards

Table A.29: Characteristics of the Mount Olivet Landfill, Seattle, Washington.

LANDFILL:

Mount Olivet Landfill, Seattle, Washington.

OWNER/OPERATOR:

Fioorillo Northwest, Inc.

Post Office Box 66826

Seattle, Washington 98166-0826

LITERATURE SOURCE:

Washington State Department of Ecology

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 1.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

Unknown.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

West and East Leachate Ponds.

MISCELLANEOUS:

|                            | 1989<br>Result | East Pon | oet Limit | Resu   | 1989 West Fond<br>tesuit D   | nd<br>Det Limit | MCL      | MCL      | Conc      |
|----------------------------|----------------|----------|-----------|--------|--|-----------------|----------|----------|-----------|
| Alabilar                   | l/an           | SN/Q     |           | l/dn   | ND/NS  |                 | l∕an     | Man      | l∕gu      |
| Acetone                    | 150.00         |          |           | 00.09  |  |                 |          |          | 700.00    |
| Dutangue                   | 94.00          |          |           | 14.00  |  |                 |          |          | 4200.00   |
| Z-Ducatono                 | 5.60           |          |           | 1.80   |  |                 |          |          | 700.00    |
| A competitions             |                | S        | 3.80      |        | ΩN   | 3.80            |          |          | 2.70      |
| Dishlorosthone             |                | Q        | 09.0      |        | QN   | 0.60            |          |          | 200.00    |
| 1,1-Dichotogram            |                | QN       | 0.50      |        | QN   | 0.50            | 3.00     |          |           |
| Diction regulatio          |                | SN       |           |        | NS   |                 |          |          | 2.00      |
| 1,4-Dioxane                |                | Ę        | 0.80      | 080    |  |                 |          | 700.00   |           |
| Ethylbenzene               |                | 914      |           |        | ž  |                 |          |          | 4200.00   |
| Methyl Ethyl Ketone (MEK.) | 30.0           | CZ.      |           |        | CZ   | 3.50            |          |          |           |
| Aethyl-2-Pentanone         | 8.30           | 9        | 130       |        | Ę  | 3 30            | 200      |          |           |
| Methylene Chloride         |                | 2        | 2.30      | 5      |  |                 | 1000 00  |          |           |
| Toluene                    | 1.00           |          | 00.0      | 200    | CIA  | 0.90            | 200 00   |          |           |
| 1, 1, 1-Trichloroethane    | 1              | Q.       | 0.00      |        | 92   | 250             | 3 00     |          |           |
| Trichloroethylene          |                | SS       |           |        | 22.2   |                 | 20.5     |          | 2100.00   |
| Prichlorofluoromethane     |                | NS       |           | 00.00  | IND  |                 | 10000 00 |          |           |
| Xylenes (Total)            |                | 2        | 1.80      | 73.00  |  |                 | 10000    |          |           |
|                            |                |          |           | ,      | NITE OF STREET   |                 | /911     | /011     | l/on      |
| Semi-Volatiles             | ng/l           | NUNN     |           | i A    | STATE OF THE PARTY |                 |          |          | 20.00     |
| Acenaphthene               |                | NS       |           |        | Q.   |                 |          |          | 700.00    |
| Acetophenone               |                | NS       |           |        | 2  | 00.             | 5        |          |           |
| Benzene                    |                | Q        | 1.00      |        | 2  | 3               | 3        |          | 00 000000 |
| Benzoic Acid               | 910.00         |          |           | 210.00 |  |                 |          |          | 48000.00  |
| Bis(2_Pthylhexyl)phthalate |                | QN       | 10.00     |        | g  | 10.00           |          |          |           |
| Cimethalahanal             |                | QX       | 20.00     |        | S  | 20.00           |          |          | 400.00    |
| 2,4-Dineulyphione          | 11 00          |          |           |        | QN   | 10.00           |          |          | 700.00    |
| -n-Butyl phthalate         | 11.00          | 2        | 00.01     |        | CZ   | 10.00           | L        |          | \$600.00  |
| ethyl Phthalate            |                | 2        | 10.01     |        |  | 200             |          |          | 280.00    |
| Phoranthene                |                | Q        | 10.00     |        | 2  | 10.00           |          |          | 6.80      |
| Nanthalene                 |                | Q.       | 10.00     |        | Q  | 10.00           |          |          | 200       |
| m&n-Creosol                | 00.079         |          |           | 74.00  |  |                 |          |          | 33.00     |
| resear                     | 36.00          |          |           |        | Q  | 10.00           |          |          | 330.00    |
| N                          |                | Q        | 10.00     |        | S  | 10.00           |          |          | 10.00     |
| enaunene                   | 130.00         |          |           | 17.00  |  |                 |          |          | 10.00     |
| riigiioi                   |                | CZ       | 10.00     |        | QN   | 10.00           |          |          | 210.00    |
| rytene                     |                |          |           |        |  |                 |          |          |           |
| 7 7 6 6 6 6                |                | NN/UN    |           | [/dn   | ND/NS  |                 | /ån      | l/ån     | ng/J      |
| Herbiciaes/Festiciaes      | 3              | 210      |           |        | 82   |                 |          |          | 0.05      |
| Alpha-BHC                  |                | 2        |           |        | Nic  |                 | 2 00     |          |           |
| ıdrin                      |                | SS       |           |        | 2 5  |                 |          |          | 010       |
| Dieldrin                   |                | NS       |           |        | SS   |                 |          |          | 200       |
| al al                      |                | SN       |           |        | SZ   |                 |          |          | 2.00      |
| Dunethoate                 |                | 2        |           |        | S.Z  |                 |          | -        | 0.50      |
| sulfoton                   |                | CZ.      |           |        | 110  |                 |          |          | 70.00     |
| 2,4,5-T                    |                | SS       |           |        | QN.  |                 | 90 05    |          |           |
| 4-D                        |                | SN       |           |        | SZ.  |                 | 00.00    | -        |           |
| עריוי                      |                | SN       |           |        | NS   |                 |          |          |           |
| H-CDE                      |                | NS       |           |        | SN   |                 |          |          |           |
| I TOW                      |                |          |           |        |  |                 |          |          |           |
| 1-2-34                     | Von            | NUN      |           | l/an   | ND/NS  |                 | /gn      | /dn      | l/an      |
| Heavy Metats               |                | NIO      |           |        | SZ   |                 | 00.9     |          |           |
| Antimony                   |                | CN SA    |           |        | N.N.   |                 | \$0.00   |          |           |
| rsenic                     |                | Z.       |           |        | NIG  |                 | 2000 00  | 0        |           |
| Barium                     |                | ž        |           |        | 2  | 8               | 9        |          | -         |
| Cadınım                    |                | Q        | 2.00      |        | 2  | 30.7            | 200      |          |           |
| Chromium                   |                | Q        | 2.00      |        | Q.   | 3.00            | 100.00   |          | -         |
| opner                      | 8.00           |          |           | 2.00   | SN   |                 | +        | 0        |           |
| I and                      |                | Q        | 30.00     |        | ΩN   | 30.00           | +        |          |           |
| DRA                        |                | 82       |           |        | SN   |                 | 2.00     |          |           |
| Mercury                    | 90.03          |          |           | 10.00  |  |                 | 100.00   | 0        |           |
| ickel                      | 20.00          | 51.4     |           |        | No.  |                 | \$0.00   |          |           |
| Selenium                   |                | 2 5      |           |        | 200  |                 |          | 100.00   |           |
| lver                       |                | ŝ        |           |        | oly.   |                 | 2.00     | +        |           |
| Thallium                   |                | SS       |           |        | CZ.  |                 | 3        | -        | 49.00     |
| anadium                    |                | SS       |           |        | 2  |                 | -        | 00 000\$ | ╀         |
| Zinc                       | 24.00          |          |           | 17.00  |  |                 | 1        | 20,000   |           |
|                            |                |          |           |        |  |                 |          | +        | 1         |
| Commentional Parameters    | l/stu          | ND/NS    | _         | /Zm    | ND/NS  | _               | mg/      | mg/      | 2         |
| CONVENIENT LA MINICIPAL    |                |          |           |        |  |                 | 1        | 1        |           |
|                            |                | SN       | -         |        | NS   |                 | <u> </u> | Н        |           |

|         |       | 1       |        | 1        | Ţ      |          | 49.00    |         |   | San I                   | I                        | 7                      |           | T       |                   |                  | 1       |         |      |                | T       |                 | T          | T                      |                        |         |                      | T               |                        |           | T         |           |        |            | T       |          | 0.63  |                              |
|---------|-------|---------|--------|----------|--------|----------|----------|---------|---|-------------------------|--------------------------|------------------------|-----------|---------|-------------------|------------------|---------|---------|------|----------------|---------|-----------------|------------|------------------------|------------------------|---------|----------------------|-----------------|------------------------|-----------|-----------|-----------|--------|------------|---------|----------|-------|------------------------------|
|         |       |         |        |          | 100.00 |          | +        | 2000.00 | + | mg/l                    |                          |                        | 250.00    |         |                   |                  |         |         | 0.30 |                | 6.5-8.5 |                 |            |                        | 300.00                 | 250.00  |                      |                 | 1                      |           | 0.05      |           |        |            |         |          |       |                              |
| 1000.00 | 15.00 | 2.00    | 100.00 | \$0.00   |        | 2.00     |          |         |   | l/gm                    | 1                        |                        |           | 0.20    |                   |                  | 10.00   | 1.00    |      |                |         |                 |            |                        |                        |         |                      |                 |                        |           |           |           | 160.00 |            |         |          |       |                              |
|         | 30.00 |         |        |          |        |          |          |         |   |                         |                          |                        |           |         |                   |                  |         |         |      | 10.00          |         |                 |            |                        |                        |         |                      |                 |                        |           |           |           |        |            |         |          |       |                              |
| NS      | ND    | NS      |        | SN       | NS     | NS       | SN       |         |   | ND/NS                   | SN                       | NS                     | NS        | NS      | NS                | NS               | SN      | NS      | NS   |                | SN      | NS              | SZ         | SS                     | NS                     | SN      | NS                   | SN              | SZ                     | SZ        | NS        | SZ        | SS     | SZ         | SN      | SN       | SN    | SZ                           |
| 2.00    |       |         | 10.00  |          |        |          |          | 17.00   |   | l/gm                    |                          |                        |           |         |                   |                  |         |         |      | 20.00          |         |                 |            |                        |                        |         |                      |                 |                        |           |           |           |        |            |         |          |       |                              |
|         | 30.00 |         |        |          |        |          |          |         |   |                         |                          |                        |           |         |                   |                  |         |         |      | 10.00          |         |                 |            |                        |                        |         |                      |                 |                        |           |           |           |        |            |         |          |       |                              |
|         | QN    | NS      |        | NS       | NS     | NS       | SN       |         |   | ND/NS                   | NS                       | NS                     | SN        | NS      | NS                | NS               | NS      | SN      | NS   |                | SN      | NS              | NS         | NS                     | NS                     | SN      | NS                   | NS              | NS                     | SZ        | NS        | NS        | NS     | NS         | NS      | SN       | SN    | NIG                          |
| 8.00    |       |         | \$0.00 |          |        |          |          | 24.00   |   | mg/l                    |                          |                        |           |         |                   |                  |         |         |      | 40.00          |         |                 |            |                        |                        |         |                      |                 |                        |           |           |           |        |            |         |          |       |                              |
| Copper  | ead   | Mercury | Nickel | Selenium | Silver | Thallium | Vanadium | Zinc    |   | Conventional Parameters | Biological Oxygen Demand | Chemical Oxygen Demand | Chlorides | Cyanide | Anmonia, Nitrogen | Organic Nitrogen | Nitrate | Nitrite | Iron | Oil and Grease | Hq      | Phenols (Total) | Phosphorus | Total Suspended Solids | Total Dissolved Solids | Sulfate | Total Organic Carbon | TOC (Duplicate) | Fotal Organic Halogens | Magnesium | Mangenese | Potassium | Sodium | Alkalinity | Calciun | Hardness | Boron | Casais Conductance (umbo/cm) |

NB - Not Sampled
ND - Not Detected
ND - Not Detected
Det Limit - Sampling
Doctors
ACL - Mexicann Contaminant Level: Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards
Guidance Concentrations - Not Enforceable Standards

Table A.31: Characteristics of the 110 Sand Company Clean Fill Landfill of New York.

LANDFILL:

110 Sand Company Clean Fill Landfill, New York.

OWNER/OPERATOR:

Broad Hollow Estates/110 Sand Company

170 Cabot Street

West Babylon, New York 11704

LITERATURE SOURCE:

New York State Department of Environmental Conservation

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 1.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

12.1 acres in Phase V. Capacity 3,300,000 cubic yards.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Double Liner.

LEACHATE SYSTEM:

Yes.

LEACHATE SAMPLE:

Leachate sample taken from leachate collection system.

MISCELLANEOUS:

None.

|  |   | 3/19/91                                  |   |   | 3/13/92   |              |  | 6/11/92  |           |  | 9/11/92   |           |   | 12/16/92  |             |  | EST, DEC   |   | _   | LST, DEC   |   |  | EST, APR   |   |
|--|---|--|---|---|---|--------------|--|--|-----------|--|---|-----------|---|---|-------------|--|--|---|---|--|---|--|--|---|
|  | Res   |  | Det Linek                               | Re  |   | Det Limit    | Re   |  | Det Limit | Ret  |   | Det Limit | Res   |   | Det Limit   | Rei  |  | Det Limit   | Res   |  | Det Limit   |  | mit  | Det Link  |
| Volatiles  | ug/l  | ND/NS                                    |   | ug/I  | ND/NS   |              | <b>199</b> 1   | ND/NS  |           | ug/l   | ND/NS   |           | wg/1  | ND/NS   |             | ug/I   | ND/NS  |   | ug/l  | ND/NS  |   | - mg/1   | ND/NS  |   |
| Acitone  | 31.00   |  | 5.00                                    | L   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             | $\vdash$   | NS   |   |   | NS   |   |  | NS   | -   |
| 2-Butanone   |   | ND                                       | 5.00                                    |   | NS  | 4.11         |  | NS   |           |  | NS NS   |           |   | NS  |             |  | NS   |   | -   | NS   |   | -  | NS   |   |
| Curbon Disuifide   |   | ND                                       | 5.00                                    |   | ND  | 5.00         |  | NS   |           |  | NS  |           | -   | NS  |             |  | NS<br>NS   |   |   | NS<br>NS   | -   |  | NS<br>NS   |   |
| Chloromethane  |   | ND                                       | 5.00                                    |   | ND  | 10.00        | -  | NS   |           |  | NS<br>NS  | _         |   | NS<br>NS  |             | $\vdash$   | NS<br>NS   |   |   | NS<br>NS   |   |  | NS<br>NS   |   |
| 1,1-Dichloroethane   |   | ND<br>ND                                 | 5.00                                    | <b>——</b>   | ND<br>ND  | 5.00         |  | NS<br>NS   |           |  | NS NS   | _         | -   | NS<br>NS  |             |  | NS<br>NS   |   |   | NS   |   | -  | NS NS  | -   |
| 2-Dichloroethane   |   | NS NS                                    | 5.00                                    | _   | NS  | 3.00         |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| 4-Dioxane  |   | ND ND                                    | 5.00                                    |   | ND  | 5.00         |  | NS NS  |           |  | NS  |           | -   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| Ethylbenzene<br>Methyl Ethyl Ketone (MEK)  |   | NS NS                                    | 3.00                                    |   | NS  | 3.00         |  | NS NS  |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| -Methyl-2-Pentanone  |   | ND                                       | 5.00                                    | <del></del>   | ND  | 10.00        |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| Anthylene Chloride   | $\overline{}$   | ND                                       | 5.00                                    |   | ND  | 5.00         |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| l'olume  |   | ND                                       | 5.00                                    | 1.00  |   | 2.44         |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| ,1,1-Trichloroethene   |   | ND                                       | 5.00                                    | 2.00  | ND  | 5.00         |  | NS   |           |  | NS  |           |   | NS  |             |  | ND   | 1.00  |   | ND   | 1.00  |  | ND   | 1.00  |
| Trichloroethylene  |   | NS                                       |   | -   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             | 2,90   |  |   |   | ND   | 0.10  |  | ND   | 1.00  |
| richlorofiuoromethane  |   | NS                                       |   |   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| Cylenes (Total)  |   | ND                                       | 5.00                                    |   | ND  | 5.00         |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
|  |   |  |   |   |   |              |  |  |           |  |   |           |   |   |             |  |  |   |   |  |   |  |  |   |
| emi-Voinities  | reg/1   | ND/NS                                    |   | ug/l  | ND/NS   |              | ug/1   | ND/NS  |           | ug/l   | ND/NS   |           | ug/l  | ND/NS   |             | 140/1  | ND/NS  |   | ug/l  | ND/NE  |   | ug/i   | ND/NS  |   |
| comphine   | 3.00  |  | 2.00                                    | 4.00  |   |              |  | NS   |           |  | NS  |           |   | NS  |             | oxdot  | NS   |   |   | NS   |   |  | NS   |   |
| cetophenone  |   | NS                                       |   |   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             | $\vdash$   | NS   |   |   | NS   |   |  | NS   |   |
| an2ane   |   | ND                                       | 2.00                                    | 1.00  |   |              |  | NS   |           |  | NS  |           |   | NS  |             | $\Box$   | NS   |   |   | NS   | $\vdash$  |  | NS   |   |
| enzoic Acid  |   | ND                                       | 2.00                                    |   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   | _   |
| is(2-Ethythexyf)phthalete  |   | ND                                       | 2.00                                    |   | ND  | 10.00        |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| 4-Dimethylphenol   |   | ND                                       | 2.00                                    |   | ND  | 10.00        |  | NS   |           |  | NS  |           | $\longrightarrow$   | NS  |             | <b></b>  | NS   | $\vdash$  |   | NS   |   | <b> </b>   | NS_  |   |
| i-n-Butyt phthainte  |   | NID                                      | 2.00                                    |   | ND  | 10.00        |  | NS   |           |  | NS  | _         |   | NS  |             | $\vdash$   | NS   |   |   | NS   | $\vdash$  | <b></b>  | NS   |   |
| ethyl Phthabate  |   | ND                                       | 2.00                                    |   | ND  | 10.00        |  | NS   |           |  | NS  |           |   | NS  |             | $\vdash$   | NS<br>NC   |   |   | NS<br>NS   |   | <b>-</b>   | NS<br>NS   |   |
| sorenthene   |   | ND                                       | 2.00                                    | _   | ND  | 10.00        |  | NS   |           |  | NS  |           |   | NS  |             | $\vdash$   | NS<br>No   |   |   | NS   | <del></del>   | <del>                                     </del>                         | NS<br>NS   |   |
| phalme   |   | ND                                       | 2.00                                    |   | ND  | 10.00        |  | NS.  |           |  | NS  |           | -   | NS  |             |  | NS<br>NS   |   |   | NS<br>NS   |   | _  | NS<br>NS   |   |
| Ap-Creosol   |   | ND                                       | 2.00                                    |   | ND  | 10.00        | _  | NS   |           |  | NS  |           | -   | NS  |             |  | NS   |   |   | NS<br>NS   |   |  | NS<br>NS   | -   |
| Creosol  |   | ND                                       | 2.00                                    |   | ND  | 10.00        |  | NS   |           |  | NS  |           |   | NS<br>NS  |             | $\vdash$   | NS<br>NS   |   |   | NS<br>NS   |   |  | NS<br>NS   |   |
| ionathrene   | $\vdash$  | ND                                       | 2.00                                    | -   | ND  | 10.00        | <u> </u>   | NS<br>NE   |           |  | NS<br>NS  |           |   | NS<br>NS  | <del></del> | <b></b>  | NS<br>NS   | $\vdash$  |   | NS<br>NS   | -   |  | NS<br>NS   | $\rightarrow$   |
| henol  |   | ND                                       | 2.00                                    |   | ND  | 10.00        |  | NS<br>NS   |           | _  | NS<br>NS  |           | -   | NS<br>NS  |             | $\vdash$   | NS<br>NS   |   |   | NS   |   | <b>—</b>   | NS<br>NS   |   |
| утиле  |   | ND                                       | 2.00                                    | -   | NID   | 10.00        |  | 142  |           |  | 143   |           |   | 140   | -           |  |  |   |   |  | 1   |  |  |   |
| Constitution (Secretary)   | 201   | NEWS                                     |   | 200   | ND/NS   |              | 9-4  | ND/NS  |           | ne4  | ND/NS   |           | ug/l  | ND/NS   |             | ug/l   | ND/NS  |   | ug/i  | ND/NS  |   | 1 mg/1   | ND/NS  |   |
| lerbicides/Pesticides  | ng/i  | ND/NS                                    | 0.10                                    | mg/1  | ND  | 0.05         | mg/1   | ND/NS<br>NS  |           | ug/l   | NS  |           | -4.   | NS  |             |  | NS   |   |   | NS   |   | 7.   | NS   |   |
| Upha-BHC   |   | ND<br>ND                                 | 0.10                                    |   | ND  | 0.10         | <b>-</b>   | NS<br>NS   |           | $\overline{}$  | NS  | _         |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| zacirius<br>Niektrin   |   | ND                                       | 0.10                                    |   | ND  | 0.10         | <u> </u>   | NS   |           |  | NS  |           |   | NS  | <u> </u>    |  | NS   | -   |   | NS   |   |  | NS   |   |
| Amethosis  |   | NS                                       | 0.10                                    | $\overline{}$   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| Amendae  |   | NS                                       | 0.10                                    |   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| 2,4.5-T  |   | NS                                       | 0.10                                    |   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| 1,4-D  |   | NS                                       | 0.10                                    |   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| BrCDD  |   | NS                                       | 0.10                                    |   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
| ExCDF  |   | NS                                       | 0.10                                    |   | NS  |              |  | NS   |           |  | NS  |           |   | NS  |             |  | NS   |   |   | NS   |   |  | NS   |   |
|  |   |  |   |   |   |              |  |  |           |  |   |           |   |   |             |  |  |   |   |  |   |  |  |   |
|  |   |  |   |   |   |              |  |  |           |  |   |           |   |   |             |  |  |   |   |  | -   |  | $\overline{}$  | $\overline{}$   |
| iony Metals  | ug/l  | ND/NS                                    |   | ug/l  | ND/NS   |              | ug/l   | ND/NS  |           | 441  | ND/NS   |           | ug/l  | ND/N8   |             | ng/i   | ND/NS  |   | ug/i  | ND/NS  |   | ng/l   | ND/NS  |   |
| icany Meinis<br>mimony   |   | ND/NS<br>ND                              | 16.00                                   | 5.80  |   |              | ug/l   | NS   |           | ug/l   | NS  |           | ug/l  | NS  |             | ug/i   | NS   |   | ug/i  | NS   |   | mg/l   | NS   |   |
| nimony<br>ramic  | 32.00   |  | 16.00                                   | 5.80<br>77.30   |   |              | ug/i   | NS<br>NS   |           | w/   | NS<br>NS  |           | ug/l  | NS<br>NS  |             | ng/l   | NS<br>ND   | 5.00  | ug/i  | NS<br>ND   | 5.00  | ugi  | NS<br>ND   | 8.00  |
| nimony<br>ramie<br>arium   |   | ND                                       |   | 5.80<br>77.30<br>722.00   |   |              |  | NS   |           | ug/l   | NS<br>NS<br>NS  |           | ug/l  | NS<br>NS  |             | mg/l   | NS<br>ND<br>NS   |   | ug/i  | NS<br>ND<br>NS   |   | ng/l   | NS<br>ND<br>NS   |   |
| ntinoery<br>rassie<br>erium<br>administr   | 32.00<br>370.00   |  | 16.00                                   | 5.80<br>77.30<br>722.00<br>15.80  |   |              | ug/1   | NS<br>NS<br>NS                                     |           | ug/l   | NS<br>NS<br>NS  | 3.00      | ug/1  | NS<br>NS<br>NS  | 2.00        | <b>11g/1</b>   | NS<br>ND<br>NS<br>ND   | 1.00  | Tigat .   | NS<br>ND<br>NS<br>ND   | 1.00  | ng/l   | NS<br>ND<br>NS<br>ND   | 0.80  |
| alimony<br>ra wide<br>urium<br>adminim<br>bronsium   | 32.00<br>370.00   | ND                                       |   | 5.80<br>77.30<br>722.00<br>15.80<br>41.60   |   |              |  | NS<br>NS<br>NS                                     |           | ug/l   | NS<br>NS<br>NS<br>ND<br>NS  | 3.00      | ug/l  | NS<br>NS<br>NS<br>ND  | 2.00        | mg/l   | NS<br>ND<br>NS<br>ND   | 1.00<br>25.00   | ug/i  | NS<br>ND<br>NS<br>ND<br>ND   | 1.00  | wgl  | NS<br>ND<br>NS<br>ND   | 0.80<br>25.00   |
| nimoory ri eric erice er | 32.00<br>370.00   | ND                                       | 4.00                                    | 5.80<br>77.30<br>722.00<br>15.80  | ND/NS   |              |  | NS<br>NS<br>NS<br>NS                               |           | ugi  | NS<br>NS<br>NS<br>ND<br>NS  |           | ug/1  | NS<br>NS<br>NS<br>ND<br>NS  |             | ng/i   | NS<br>ND<br>NS<br>ND<br>ND   | 1.00<br>25.00<br>25.00                                  | ug/l  | NS<br>ND<br>NS<br>ND<br>ND   | 1.00<br>25.00<br>25.00                                  | wyl  | NS<br>ND<br>NS<br>ND<br>ND   | 0.80<br>25.00<br>16.00                                  |
| nilinorry ra eric rinten sidminin hrominin prominin erominin erominin erominin   | 32.00<br>370.00   | ND<br>ND                                 | 4.00                                    | 5.80<br>77.30<br>722.00<br>15.80<br>41.60   | ND/NS   | 10.00        |  | NS<br>NS<br>NS<br>NS<br>NS                         | 4.20      | ugi  | NS<br>NS<br>NS<br>ND<br>NS<br>NS                                  | 3.00      | ug/l  | NS<br>NS<br>NS<br>ND<br>NS<br>NS  | 2.00        | ng/i   | NS<br>ND<br>NS<br>ND<br>ND<br>ND   | 1.00<br>25.00<br>25.00<br>3.00                          | lager .   | NS<br>ND<br>NS<br>ND<br>ND<br>ND   | 1.00<br>25.00<br>25.00<br>5.00                          | ng1  | NS<br>ND<br>NS<br>ND<br>ND<br>ND   | 0.80<br>25.00<br>16.00<br>4.00                          |
| nimony reads reads adminim bronsium popper end fercury   | 32.00<br>370.00   | ND<br>ND<br>ND                           | 4.00<br>14.00<br>0.20                   | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20                                    | ND/NS   | 10.00        |  | NS<br>NS<br>NS<br>NS<br>NS<br>NS                   | 4.20      | ugi  | NS<br>NS<br>ND<br>NS<br>ND<br>NS<br>ND                            |           | ug/l  | NS NS NS ND NS ND NS NS NS NS NS  |             | ug/i   | NS<br>ND<br>NS<br>ND<br>ND<br>ND<br>ND   | 1.00<br>25.00<br>25.00                                  | Ngs .   | NS<br>ND<br>NS<br>ND<br>ND<br>ND<br>ND                                     | 1.00<br>25.00<br>25.00                                  | ng1  | NS ND NS ND ND ND ND ND ND ND  | 0.80<br>25.00<br>16.00                                  |
| alinony ranic mise mise admisse admisse popper end end fercery   | 32.06<br>370.00<br>15.00<br>10.00   | ND<br>ND                                 | 4.00                                    | 5.80<br>77.30<br>722.00<br>15.80<br>41.60   | ND/NS   | 0.20         |  | NS N           | 4.20      | eg/i   | NS                                     |           | ug/l  | NS NS NS ND NS NS ND NS NS NS NS ND NS                                  |             | ug/i   | NS ND NS ND  | 1.00<br>25.00<br>25.00<br>3.00<br>0.20                  | ug/i  | NS ND NS ND                                     | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | wyl  | NS ND NS ND NS                                  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40                  |
| nilinony In wice striam Admission Thronisism Thronisism Gopper end Sercury Ectel   | 32.00<br>370.00   | ND<br>ND<br>ND<br>ND<br>ND               | 4.00<br>14.00<br>0.20<br>14.00          | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20                                    | ND/NS ND ND ND ND   | 2.00         |  | NS NS NS NS NS NS NS NS NS ND NS NS NS NS NS NS NS | 4.20      | eg/i   | NS                                  |           | ug/l  | NS NS NS ND NS NS NS NS NS NS ND NS NS NS NS NS NS                      |             | mg/l   | NS ND NS ND  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | ug/i  | NS ND NS ND                            | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | wyl  | NS ND NS ND                            | 0.80<br>25.00<br>16.00<br>4.00<br>0.40                  |
| althoury In wise when administration | 32.06<br>370.00<br>15.00<br>10.00   | ND<br>ND<br>ND<br>ND<br>ND               | 4.00<br>14.00<br>0.20<br>14.00          | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20                                    | ND/NS ND ND ND ND ND ND   | 2.00<br>3.00 |  | NS N           | 4.20      | egn.   | NS NS NS NS ND NS NS NS NS NS ND NS NS NS NS NS NS NS NS          |           | ug/l  | NS NS NS ND NS                            |             | mg/i   | NS ND NS ND  | 1.00<br>25.00<br>25.00<br>3.00<br>0.20                  | ugi   | NS ND NS ND                            | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | <b>4</b>   | NS ND ND ND ND NS NS ND ND ND NS ND NS ND NS ND ND ND ND ND ND ND ND       | 0.80<br>25.00<br>16.00<br>4.00<br>0.40                  |
| althoory r to neic orban adminim admin | 32.06<br>370.00<br>15.00<br>10.00   | NID NID NID NID NID NID NID NID NID      | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20                                    | ND/NS ND ND ND ND   | 2.00         |  | NS NS NS NS NS NS NS NS NS ND ND NS NS NS NS       | 4.20      | ugi.   | NS N                          |           | ug/l  | NS NS NS ND NS                      |             | mg/i   | NS ND NS ND NS  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | ugi   | NS ND NS ND ND ND ND ND ND ND NS ND NS ND NS ND ND ND NS                   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | ugi  | NS ND NS ND ND ND NS NS NS             | 0.80<br>25.00<br>16.00<br>4.00<br>0.40                  |
| althoory and welc when administra administra fromistra popper end  | 32.00<br>370.00<br>15.00<br>10.00   | ND<br>ND<br>ND<br>ND<br>ND               | 4.00<br>14.00<br>0.20<br>14.00          | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80                           | ND/NS ND ND ND ND ND ND   | 2.00<br>3.00 |  | NS N           | 4.20      | ugi  | NS NS NS NS ND NS NS NS NS ND NS |           | ugi   | NS NS NS ND NS                      |             | mg/l   | NS ND  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 |   | NS ND NS ND                            | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | ugi  | NS ND NS ND ND ND ND NS ND NS ND NS ND NS ND NS ND NS NS NS NS NS          | 0.80<br>25.00<br>16.00<br>4.00<br>0.40                  |
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| althoory rates when adminum ad | 32.06<br>370.00<br>15.00<br>10.00<br>5.00   | ND ND ND ND ND ND ND ND                  | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80                           | ND/NS ND ND ND ND ND ND   | 2.00<br>3.00 | 3.40   | NS N           | 4.20      |  | NS NS NS NS ND NS             |           |   | NS   |             |  | NS ND  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00  | NS ND NS ND NS ND ND ND ND ND NS ND NS ND NS ND NS NS                      | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  |  | NS ND NS ND ND ND ND NS ND NS ND NS ND NS ND NS ND NS NS NS NS NS          | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| nimony r ratic prium adminim romatum opper oud decum oud oud decum oud   | 32.06<br>370.00<br>15.00<br>10.00<br>5.00   | NID NID NID NID NID NID NID NID NID      | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80                           | ND/NS ND   | 2.00<br>3.00 |  | NS N           | 4.20      | ugi  | NS N                          |           | ug/l  | NS N                                |             | mg/l   | NS ND NS ND  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 |   | NS ND NS ND ND ND ND ND ND ND NS ND NS ND NS ND ND ND NS                   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | ug1  | NS ND                                  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| although results and results a | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00  | ND ND ND ND ND ND ND ND                  | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80                           | ND/NS ND                                | 2.00<br>3.00 | 3.40   | NS N           | 4.20      |  | NS NS NS NS ND NS             |           |   | NS   |             |  | NS ND NS ND  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00          | 100.00  | NS ND NS ND NS ND ND ND ND ND ND ND NS | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  |  | NS ND NS ND NS ND NS ND NS ND NS       | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| nitroory I state  rivan  denian  reclaimen  reclaimen  reclaimen  popper  end  dercury  cicle  detailen  bracker  machine  inc   | 32.06<br>370.00<br>15.00<br>10.00<br>5.00   | ND ND ND ND ND ND ND ND                  | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80                           | ND/NS ND                                | 2.00<br>3.00 | 3.40   | NS N           | 4.20      | mg/l   | NS N                          |           | mag/1   | NS N                                |             |  | NS ND NS ND  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00          | 100.00  | NS ND NS ND ND ND ND ND ND NS ND ND NS NS NS NS                            | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  |  | NS ND ND ND ND NS NS NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| nitroory result relate  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00  | ND ND ND ND ND ND ND ND                  | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80                           | ND/NS ND                                | 2.00<br>3.00 | 3.40<br>3.40<br>mg/l   | NS N           | 4.20      | mg1 540.00   | NS N                          |           | mag/1 630.00  | NS N                                |             | mg/l   | NS ND NS ND  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00          | 100.00 mg/l   | NS ND NS ND ND ND ND ND ND NS ND ND NS NS NS NS                            | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | mg1  | NS ND NS ND NS NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althousy : in suic  infur  inf | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>960.00<br>540.00<br>540.00  | ND ND ND ND ND ND ND ND                  | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80<br>52.70<br>47.90         | ND/NS ND                                | 2.00<br>3.00 | 3.40<br>3.40<br>mg/l   | NS N           | 4.20      | mg1 540.00   | NS NS NS NS NS ND NS          |           | mag/1 630.00  | NS                                  |             | mgl  | NS NID NS NID NS NID NID NID NID NID NID NIS NIS NID NIS NIS NID NID NID NID NIS | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00          | 100.00 mg/l   | NS ND NS ND NS ND ND ND ND ND ND NS ND ND NS ND NS NS NS NS NS             | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | mg1  | NS ND ND ND ND NS NS NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury relate prison admission relate rela | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>92.00<br>960.00<br>340.00  | ND ND ND ND ND ND ND ND                  | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80<br>52.70<br>47.90         | ND/NS ND                                | 2.00<br>3.00 | 3.40<br>mag/1<br>1100.00<br>1300.00  | NS N           | 4.20      | 1 540.00<br>600.00   | NS NS NS NS NS ND NS          |           | mag/1 639.00 580.00   | NS                                  |             | mg/l   | NS NID NS NID NS NID NID NID NID NID NID NIS NIS NID NIS NIS NID NID NID NID NIS | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00 mg/l   | NS ND NS ND NS ND ND ND ND ND ND NS ND ND NS ND NS NS NS NS NS             | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg1 1140.00 20.30  | NS ND ND ND ND NS NS NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury za serie striam adminim adminim remains opper end fercusy leckel etentiam about ballium ballium ballium conditional parameter iological Oxygen Demand themical Oxygen Demand  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>960.00<br>540.00<br>540.00  | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80<br>52.70<br>47.90         | ND/NS ND ND ND ND ND ND ND ND NS NS NS NS NS                                | 2.00<br>3.00 | 3.40<br>mag/1<br>1100.00<br>1300.00  | NS N           | 4.20      | 1 540.00<br>600.00   | NS NS NS NS ND NS ND NS       |           | mag/1 639.00 580.00   | NS MS MS MS MS MS MD MS MS MS MD MS |             | mg/l 200.00 3.47   | NS ND NS ND ND ND ND ND NS ND NS ND NS ND NS NS NS NS NS NS NS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00          | 100.00 mg/l 160.00  | NS ND NS NS ND NS NS ND ND NS NS NS NS          | 1.00<br>25.00<br>25.00<br>5.00<br>0.20                  | mg1  | NS ND ND NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| літопу   | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>240.00<br>0.04<br>120.00   | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | ND/NS ND NS NS                             | 2.00<br>3.00 | 3.40<br>3.40<br>1100.00<br>1300.00   | NS N           |           | \$40.00<br>\$00.00<br>\$1.00   | NS NS NS NS ND NS             |           | 630.00<br>580.00<br>91.00   | NS NS NS NS NS ND NS                |             | 200.00<br>3.47<br>0.25   | NS ND  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00<br>mg/l<br>160.00<br>15.12<br>0.04   | NS ND ND ND ND ND ND NS ND NS ND NS ND NS NS NS NS NS                      | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/1 1140.00 20.30 0.40  | NS MD ND ND NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury rated return adminim  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>26.00<br>960.00<br>840.00<br>0.04  | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>15.80<br>41.60<br>14.20<br>57.80<br>52.70<br>47.90         | ND/NS  ND ND ND ND ND ND ND NS NS NS NS NS NS                               | 2.00<br>3.00 | 3.40<br>mag/1<br>1100.00<br>1300.00  | NS N           |           | mg1<br>540.00<br>600.00  | NS NS NS NS ND ND NS          |           | mag/1<br>630.00<br>580.00<br>91.00  | NS MS                               |             | mg/l 200.00 3.47   | NS ND ND ND NS NS NS NS NS NS  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00 mg/l 160.00  | NS MD ND ND NS NS NS NS NS NS NS NS  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg1 1140.00 20.30  | NS ND ND NS NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury r racic orium adminum adminum r romainum opper ond officer opper ond opper  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>240.00<br>0.04<br>120.00   | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | ND/NS ND ND ND ND ND ND ND NS NS NS NS                                      | 2.00<br>3.00 | 3.40<br>3.40<br>1100.00<br>1300.00   | MS M           |           | \$40.00<br>\$00.00<br>\$1.00   | NS NS NS ND ND NS             |           | 630.00<br>580.00<br>91.00   | NS MS                               |             | 200.00<br>3.47<br>0.26   | NS ND NS ND ND ND ND ND NS ND NS ND NS ND NS NS NS NS NS NS NS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00 mg/l 160.00 15.28 0.04   | NS ND NS NS ND NS NS ND ND NS NS NS NS          | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg1 1140.00 20.30 0.40   | NS ND ND NS NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury r racic orkum adminim r racic orkum adminim r romains opper ond fercusy clicke leteium leteiu | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>240.00<br>0.04<br>120.00   | MD M | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | ND/NS ND ND ND ND ND ND ND ND ND NS NS NS NS NS                             | 2.00<br>3.00 | 3.40<br>3.40<br>1100.00<br>1300.00<br>170.00   | NS N           |           | mg1 540.00 600.00 81.00 1.30   | NS NS NS NS ND ND NS          |           | mag/1<br>630.00<br>580.00<br>91.00<br>0.75  | NS MS                               |             | 200.00<br>3.47<br>0.26   | NS ND ND ND NS NS NS NS NS NS  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00<br>mg/l<br>160.00<br>15.12<br>0.04   | NS MD ND ND NS NS NS NS NS NS NS NS  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/l 1140.00 20.30 0.40 9.60   | NS ND ND NS NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury I static when adminish opper oper oper oper oper oper oper ope  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>240.00<br>0.04<br>120.00   | ND ND ND ND ND ND ND ND ND NS NS NS      | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | ND/NS ND ND ND ND ND ND ND NS NS NS NS NS NS                                | 2.00<br>3.00 | 3.40<br>3.40<br>1100.00<br>1300.00   | NS N           |           | \$40.00<br>\$00.00<br>\$1.00   | NS NS NS NS ND NS             |           | 630.00<br>580.00<br>91.00   | NS N                                |             | 200.00<br>3.47<br>0.26   | MS MID MS MD MD MD MD MD MD MD MS MD MS MD MS MD MS                              | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00 mg/l 160.00 15.28 0.04   | NS MD NS MD NS NS NS NS NS NS NS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg1 1140.00 20.30 0.40   | NS ND ND NS NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury I read:  orban  orban  opper  ond  forcusy  clote  clote  orban   32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>26.00<br>960.00<br>840.00<br>0.04<br>120.00  | MD M | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | ND/NS ND ND ND ND ND ND ND NS NS NS NS NS NS NS NS NS                       | 2.00<br>3.00 | 3.40<br>3.40<br>1100.00<br>1300.00<br>170.00   | NS N           |           | mg1 540.00 600.00 81.00 1.30   | NS NS NS ND ND NS             |           | mag/1<br>630.00<br>580.00<br>91.00<br>0.75  | NS  |             | 200.00<br>3.47<br>0.26   | MS MD MS MD MS MD MD MD MD MD MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00<br>mg/l<br>160.00<br>15.12<br>0.04   | NS ND NS ND ND ND ND ND ND ND NS ND NS ND NS ND NS NS NS NS NS NS NS       | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/1 1140.00 20.30 0.40 9.60   | NS MD NS MD NS NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
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| althousy rate and rat | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>960.00<br>240.00<br>0.04<br>120.00<br>0.29  | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | ND/NS ND ND ND ND ND ND ND NS           | 2.00<br>3.00 | 3.40  3.40  mg/l  1100.00 1300.00  14.00  0.03   | NS N           |           | \$40.00<br>\$00.00<br>\$1.00<br>22.00<br>2400.00   | NS NS NS ND ND NS             |           | 91.00<br>0.75<br>7.10   | NS  |             | 200.00<br>3.47<br>0.26<br>12.00<br>7.29<br>0.03                                | MS MD MS MD MS MD MD MD MD MD MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00<br>mg/l<br>160.00<br>15.18<br>0.04<br>14.00<br>6.50<br>0.46                                | NS ND NS ND ND ND ND ND ND ND NS ND NS ND NS ND NS NS NS NS NS NS NS NS    | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/1 1140.00 20.30 0.40 9.60 6.72 0.02                                   | NS ND NS NS NS NS NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury service of the control of t | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>0.04<br>120.00<br>0.29<br>30.00  | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | NDANS  ND N                             | 2.00<br>3.00 | 3.40  3.40  1100.00  1300.00  170.00  14.00  0.03  | NS N           |           | 1.30<br>22.00<br>220.00  | NS NS NS ND ND NS             |           | 300.00<br>580.00<br>91.00<br>0.75<br>7.10   | NS  |             | 200.00<br>3.47<br>0.26<br>12.00<br>7.29<br>0.03                                | MS MD MS MD MS MD MD MD MD MD MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00  160.00  15.28 0.04  14.00  6.50 0.46  | NS ND NS ND ND ND ND ND ND ND NS ND NS ND NS ND NS NS NS NS NS NS NS NS    | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/1 1140.00 20.30 0.40 9.60 6.72 0.02                                   | NS ND NS                               | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury - reside - r | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>960.00<br>240.00<br>0.04<br>120.00<br>0.29  | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | ND/NS ND ND ND ND ND ND ND ND NS        | 2.00<br>3.00 | 3.40  3.40  mg/l  1100.00 1300.00  14.00  0.03   | MS   |           | \$40.00<br>\$00.00<br>\$1.00<br>22.00<br>2400.00   | NS N                          |           | 91.00<br>0.75<br>7.10   | NS N                                |             | 200.00<br>3.47<br>0.26<br>12.00<br>7.29<br>0.03                                | MS MD MS MD MD MD MD MD MD MD MD MD MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00<br>mg/l<br>160.00<br>15.18<br>0.04<br>14.00<br>6.50<br>0.46                                | NS ND NS                               | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/1 1140.00 20.30 0.40 9.60 6.72 0.02                                   | NS NS ND NS                            | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury stack risum cdesima reach risum cdesima reach risum cdesima reach risum and   | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>0.04<br>120.00<br>0.29<br>30.00  | MD M | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77:30<br>722:00<br>15:80<br>41:60<br>14:20<br>57:80<br>52:70<br>47:90<br>mg/1 | NDANS  ND ND ND ND ND ND ND ND ND NS    | 2.00<br>3.00 | 3.40  3.40  1100.00  1300.00  170.00  14.00  0.03  | NS N           |           | 1.30<br>22.00<br>220.00  | NS N                          |           | 300.00<br>580.00<br>91.00<br>0.75<br>7.10   | NS N                                |             | 200.00<br>3.47<br>0.26<br>12.00<br>7.29<br>0.03                                | MS MD MD MD MD MD MD MD MD MD MS MD MD MS  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00  160.00  15.28 0.04  14.00  6.50 0.46  | NS N                                   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/1 1140.00 20.30 0.40 9.60 6.72 0.02                                   | NS NS NS NS NS NS NS NS  | 0.80<br>25.00<br>16:00<br>4.00<br>0.40<br>4.00<br>10.00 |
| istoory words of the control of the  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>340.00<br>0.29<br>30.00<br>17.00<br>3700.00<br>400.00<br>290.00  | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>722.00<br>13.80<br>14.20<br>57.80<br>52.70<br>0.02                   | ND/NS ND ND ND ND ND ND ND ND NS        | 2.00<br>3.00 | 3.40<br>3.40<br>1100.00<br>170.00<br>140.00<br>0.03<br>400.00<br>29.00<br>340.00   | MS   |           | \$40.00<br>\$00.00<br>\$1.00<br>1.30<br>22.00<br>0.02<br>2400.00<br>180.00   | NS N                          |           | 830.00<br>580.00<br>91.00<br>0.75<br>7.10<br>1900.00<br>320.00<br>160.00  | NS N                                |             | 200.00<br>3.47<br>0.26<br>12.00<br>7.29<br>0.03                                | MS MD MS MD  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00  160.00  15.28 0.04  14.00  6.50 0.46  | MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/1 1140.00 20.30 0.40 9.60 6.72 0.02                                   | NS ND NS ND                            | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00          |
| dissory assic risan denism resid risan denism recory denis | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>26.00<br>260.00<br>120.00<br>30.00<br>30.00<br>30.00<br>400.00<br>290.00   | MD M | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>72.20<br>15.80<br>14.80<br>14.20<br>57.80<br>52.70<br>47.90<br>0.02  | NDANS  ND NS | 2.00<br>3.00 | 3.40 3.40 1100.00 1300.00 170.00 4000.00 29.00 340.00  | NS N           |           | mg1<br>540.00<br>600.00<br>\$1.00<br>1.30<br>22.00<br>0.02<br>2400.00<br>180.00  | NS N                          |           | mag/1<br>630.00<br>580.00<br>91.00<br>0.75<br>7.10<br>1900.00<br>320.00<br>160.00   | NS N                                |             | 3.47<br>0.26<br>12.00<br>7.29<br>0.03<br>1570.00<br>622.00<br>15.00            | MS MD MD MD MD MD MD MD MD MD MS MD MD MS  | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00 mg/l 160.00 15.12 0.04 14.00 6.90 0.46 870.00 60.00  | NS N                                   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mgf 1140.00<br>20.30<br>0.40<br>9.60<br>6.72<br>0.02<br>1810.00<br>63.00 | NS NS NS NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00          |
| althoury althoury area of a control of a con | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>91.00<br>\$40.00<br>0.04<br>120.00<br>3700.00<br>400.00<br>290.00  | MD M | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>72.20<br>13.80<br>14.60<br>14.20<br>57.80<br>52.70<br>47.90<br>0.02  | ND/NS ND ND ND ND ND ND NS              | 2.00<br>3.00 | 3.40   | NS N           |           | 340.00<br>600.00<br>81.00<br>1.30<br>22.00<br>0.02<br>2400.00<br>180.00  | NS N                          |           | \$30.00<br>\$80.00<br>91.00<br>0.75<br>7.10<br>1900.00<br>320.00<br>160.00  | NS N                                |             | 200.00<br>3.47<br>0.26<br>12.00<br>7.29<br>0.03                                | NS ND NS ND ND NS ND ND ND ND NS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00  160.00  15.28 0.04  14.00  6.50 0.46  | NS ND NS                               | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg/1 1140.00 20.30 0.40 9.60 6.72 0.02                                   | NS ND NS ND ND ND NS ND ND ND ND ND NS | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury states of the states  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>26.00<br>260.00<br>260.00<br>30.00<br>120.00<br>400.00<br>290.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200. | MD M | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>72.20<br>15.80<br>14.80<br>14.20<br>57.80<br>52.70<br>47.90<br>0.02  | ND/NS ND ND ND ND ND ND ND NS           | 2.00<br>3.00 | 1100.00<br>1300.00<br>170.00<br>1400.00<br>29.00<br>340.00<br>180.00<br>3.30   | NS N           |           | mg/l<br>540.00<br>600.00<br>\$1.00<br>1.30<br>22.00<br>0.02<br>2400.00<br>200.00<br>180.00   | NS N                          |           | 7.10<br>1900.00<br>320.00<br>580.00<br>91.00<br>0.75<br>7.10<br>1900.00<br>320.00<br>160.00   | NS N                                |             | 3.47<br>0.26<br>12.00<br>7.29<br>0.03<br>1570.00<br>622.00<br>15.00            | MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00 mg/l 160.00 15.12 0.04 14.00 6.90 0.46 870.00 60.00  | NS N                                   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mgf 1140.00<br>20.30<br>0.40<br>9.60<br>6.72<br>0.02<br>1810.00<br>63.00 | NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury services of the control of  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>0.04<br>120.00<br>0.04<br>120.00<br>3700.00<br>400.00<br>290.00  | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>72.20<br>13.80<br>14.60<br>14.20<br>57.80<br>52.70<br>47.90<br>0.02  | NDANS  ND N                             | 2.00<br>3.00 | 3.40  3.40  1100.00 1300.00 170.00  14.00 0.03 4000.00 3.30 320.00 180.00 3.30 270.00  | NS N           |           | 1.30<br>22.00<br>1.30<br>22.00<br>200.00<br>180.00<br>200.00<br>180.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00   | NS N                          |           | \$39.00<br>\$80.00<br>91.00<br>9.75<br>7.10<br>0.04<br>1900.00<br>160.00<br>110.00  | NS N                                |             | 200.00<br>3.47<br>0.26<br>12.00<br>12.00<br>1570.00<br>522.00<br>15.00         | NS ND NS ND ND NS ND ND ND ND NS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00  160.00  15.28 0.04  14.00  6.90 0.46  1150.00  870.00 60.00                               | NS ND NS                               | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg? 1140.00 20.30 0.40 9.60 672 0.02 1810.00 63.00                       | NS ND NS ND ND ND NS ND ND ND ND ND NS | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althousy results and contains a contain and contains a contain a c | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>950.00<br>240.00<br>0.04<br>120.00<br>3700.00<br>400.00<br>290.00<br>290.00<br>200.00<br>200.00   | ND N | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>15.80<br>15.80<br>14.80<br>14.20<br>57.80<br>52.70<br>0.02           | ND/NS ND ND ND ND ND ND ND ND ND NS     | 2.00<br>3.00 | 3.40  1100.00 1300.00 170.00  4000.00 29.00 340.00 180.00 350 350 300 3100.00  | NS N           |           | 1.30<br>22.00<br>0.02<br>2400.00<br>200.00<br>180.00<br>180.00<br>200.00<br>180.00<br>200.00<br>120.00<br>230.00<br>1100.00  | NS N                          |           | 7.10<br>1900.00<br>320.00<br>110.00<br>110.00<br>110.00<br>110.00<br>160.00<br>290.00<br>290.00                                     | NS N                                |             | 200.00<br>3.47<br>0.26<br>12.00<br>7.29<br>0.03<br>15.70.00<br>622.00<br>15.00 | MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00<br>160.00<br>15.12<br>0.04<br>14.00<br>6.90<br>0.46<br>1150.90<br>870.00<br>60.00<br>22.00 | NS N                                   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg4 1140.00 20.30 0.40 9.60 6.72 0.02 1810.80 0.30 0.00 23.00            | NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| althoury r rance return administra return admini | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>91.00<br>960.00<br>120.00<br>120.00<br>3700.00<br>290.00<br>200.00<br>200.00<br>200.00<br>200.00<br>200.00  | MD M | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>72.20<br>15.80<br>14.80<br>14.20<br>57.80<br>52.70<br>47.90<br>0.02  | NDANS  ND N                             | 2.00<br>3.00 | 3.40<br>3.40<br>1100.00<br>170.00<br>14.00<br>0.03<br>4000.00<br>29.00<br>340.00<br>180.00<br>180.00<br>180.00<br>180.00<br>180.00<br>180.00<br>180.00 | NS N           |           | \$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00<br>\$1.00 | NS N                          |           | 300.00<br>\$80.00<br>91.00<br>9.75<br>7.10<br>0.04<br>1900.00<br>320.00<br>160.00<br>110.00<br>140.00<br>940.00<br>940.00<br>940.00 | NS N                                |             | 200.00  3.47 0.26  12.00  12.00  1570.00  622.00  31.00                        | MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00  160.00  15.28  0.04  14.00  6.90  0.46  1150.00  22.00                                    | NS N                                   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg? 1140.00 20.30 0.40 9.60 672 0.02 1810.00 63.00                       | NS NS ND ND ND NS                      | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |
| nithonyy reside refun  administ repair  repair  repair  opper  reconstrat  opper  reconstrat  opper  reconstrat  opper  reconstrat  opper  reconstrat  | 32.00<br>370.00<br>15.00<br>10.00<br>5.00<br>91.00<br>950.00<br>240.00<br>0.04<br>120.00<br>3700.00<br>400.00<br>290.00<br>290.00<br>200.00<br>200.00   | MD M | 4.00<br>14.00<br>0.20<br>14.00<br>14.00 | 5.80<br>77.30<br>15.80<br>15.80<br>14.80<br>14.20<br>57.80<br>52.70<br>0.02           | ND/NS ND ND ND ND ND ND ND ND ND NS     | 2.00<br>3.00 | 3.40  1100.00 1300.00 170.00  4000.00 29.00 340.00 180.00 350 350 300 3100.00  | NS N           |           | 1.30<br>22.00<br>0.02<br>2400.00<br>200.00<br>180.00<br>180.00<br>200.00<br>180.00<br>200.00<br>120.00<br>230.00<br>1100.00  | NS N                          |           | 7.10<br>1900.00<br>320.00<br>110.00<br>110.00<br>110.00<br>110.00<br>160.00<br>290.00<br>290.00                                     | NS N                                |             | 200.00<br>3.47<br>0.26<br>12.00<br>7.29<br>0.03<br>15.70.00<br>622.00<br>15.00 | MS   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | 100.00<br>160.00<br>15.12<br>0.04<br>14.00<br>6.90<br>0.46<br>1150.90<br>870.00<br>60.00<br>22.00 | NS N                                   | 1.00<br>25.00<br>25.00<br>5.00<br>0.20<br>5.00<br>10.00 | mg4 1140.00 20.30 0.40 9.60 6.72 0.02 1810.80 0.30 0.00 23.00            | NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00<br>10.00 |

and Company Cleanfill of New York.

| WF                                      | ST, APR  | 36   | F.4  | ST, APR   | 86 I   | PH  | III, APR   | 22                             | Primary  | Secondary                                      | Guidunce |
|---|--|--|--|---|--|---|--|--------------------------------|--|--|----------|
| em                                      | K  | Det Lineit                                     | Res  | *   | Det Link                                       | Res   |  | Det Limit                      | MCL.   | MCL  | Cenc     |
|   | ND/NS  |  | 144/1  | ND/NS   |  | 1997  | ND/NS  |                                | 198/1  | ug/I   | mp/l     |
|   | NS   |  |  | NS  |  |   | NS   |                                |  |  | 700.00   |
| П                                       | NS   |  |  | NS.   |  |   | NS   |                                |  |  | 4200.00  |
|   | NS   |  |  | NS  |  |   | NS   |                                |  |  | 700.00   |
| Ι                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  | 2,70     |
| Ι                                       | NS   |  |  | NS.   |  |   | NS   |                                |  |  | 700.00   |
| Ι                                       | NS   |  |  | NS  |  |   | NS   | $\Box$                         | 3.00   |  |          |
| I                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  | 5.00     |
| Ш                                       | NS   |  |  | NS  |  |   | NS.  |                                |  | 700.00   | 4700 55  |
| 4                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  | 4200.00  |
| 1                                       | NS   |  |  | NS  |  |   | NS   |                                | 400  |  |          |
| 1                                       | NS   |  |  | NS  |  |   | NS   |                                | 5.00<br>1000.00  |  | -        |
| 4                                       | NS   | 1.00   |  | NS<br>ND  | 1.00   |   | NS   | 1.00                           | 200.00   |  |          |
| H                                       | ND   | 1.00   | 3.00   | ND  | 1.00   |   | ND<br>ND   | 1.00                           | 3.00   |  |          |
| 4                                       | ND   | 1.00   | 3.00   | NS  |  | _   | NS   | 1.00                           | 3.00   |  | 2100.00  |
| 4                                       | NS<br>NS   |  |  | NS  |  |   | NS   |                                | 10000.00   |  | 2100.00  |
| +                                       | No   |  |  | No  |  |   | 7449   |                                | 10000.00   |  |          |
| Н                                       | ND/NS  |  | ng/i   | ND/NS   |  | mg/1  | ND/NS  |                                | ug/l   | mg/1   | ug/l     |
| H                                       | NS   |  | 7.   | NS  |  |   | NS   |                                |  |  | 20.00    |
| +                                       | NS   |  |  | NS  |  |   | NS   |                                | · ·  |  | 700.00   |
| +                                       | NS   |  |  | NS  |  |   | NS   |                                | 1.00   |  |          |
| +                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  | 28000.00 |
| +                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  |          |
| +                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  | 400.00   |
| +                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  | 700.00   |
| $\top$                                  | NS   |  |  | NS  |  |   | NS   |                                |  |  | 5600.00  |
|   | NS   |  |  | NS  |  |   | NS_  |                                |  |  | 280.00   |
| I                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  | 6.80     |
| $\Box$                                  | NS   |  |  | NS  |  |   | NS   |                                |  |  | 35.00    |
| $\Box$                                  | NS   |  |  | NS  |  |   | NS   |                                |  |  | 350.00   |
| П                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  | 10.00    |
| Ц                                       | NS   |  |  | NS  |  |   | NS   |                                | <b></b>  |  | 10.00    |
| 4                                       | NS   |  | -  | N3  |  |   | NS   |                                |  |  | 210.00   |
| Н                                       |  |  |  |   |  |   |  |                                |  |  |          |
| 4                                       | ND/NS  |  | wg/L   | ND/NS   |  | ug/l  | ND/NS  |                                | **g/1  | <b>ug/</b> 1                                   | 10g/l    |
| 4                                       | NS   |  |  | NS  |  |   | NS   |                                | 3.00   |  | 0.05     |
| H                                       | NS   | _  |  | NS  | -  |   | NS<br>NS   |                                | 2.00   |  | 0.10     |
| Н                                       | NS   | -  |  | NS<br>NS  |  |   | NS   |                                |  |  | 5.00     |
| +                                       | NS<br>NS   | <del></del>                                    |  | NS<br>NS  |  | -   | NS   | -                              | <del>                                     </del>   |  | 0.50     |
| Н                                       | NS<br>NS   |  | -  | NS  | -  | $\vdash$  | NS<br>NS   | 1                              | <b>—</b>   |  | 70.00    |
| H                                       | NS<br>NS   | 1  |  | NS  |  | $\vdash$  | NS   |                                | 70.00  |  | , 5.00   |
| H                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  |          |
| Н                                       | NS   |  |  | NS  |  |   | NS   |                                |  |  |          |
| H                                       |  |  |  |   |  |   |  |                                |  |  |          |
| П                                       | ND/NS  |  | mg/l   | ND/NS   | I  | ug/1  | ND/N6  |                                | mg/l   | ug/l   | wg/I     |
| Н                                       | NS   |  |  | NS  |  |   | NS   |                                | 6.00   |  |          |
|   |  |  |  |   |  | 11.00   |  | 1                              | 50.00  |  |          |
| П                                       | ND   | 8.00   |  | ND  | 8.00   | 11.00   |  |                                |  |  |          |
| Н                                       | ND<br>NS   | 8.00   |  | NS  |  | 11.00   | NS   |                                | 2000.00  |  |          |
|   | NS<br>ND   | 0.80   |  | NS<br>ND  | 0.00   | 11.00   | ND   | 10.00                          | 2000.00<br>5.00  |  |          |
|   | ND<br>ND   | 0.80<br>25.00                                  |  | NS  |  | 11.00   | ND<br>ND   | 10.00                          | 2000.00<br>5.00<br>100.00  |  |          |
|   | ND<br>ND   | 0.80<br>25.00<br>16.00                         | 23.00  | NS<br>ND<br>ND  | 0.80   | 11.00   | ND<br>ND<br>ND   | 10.00                          | 2000.00<br>5.00<br>100.00<br>1000.00   |  |          |
|   | NS<br>ND<br>ND<br>ND   | 0.80<br>25.00<br>16.00<br>4.00                 | 23.00  | NS<br>ND<br>ND  | 0.80<br>25.00<br>4.00                          | 11.00   | ND<br>ND<br>ND   | 10.00<br>10.00<br>5.00         | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00  |  |          |
|   | NS<br>ND<br>ND<br>ND<br>ND   | 0.80<br>25.00<br>16.00                         | 23.00  | NS<br>ND<br>ND<br>ND  | 0.80   | 11.00   | ND<br>ND<br>ND<br>ND   | 10.00                          | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00                                      |  |          |
|   | NS<br>ND<br>ND<br>ND<br>ND<br>ND   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40         | 23.00  | NS<br>ND<br>ND<br>ND<br>ND<br>ND  | 0.80<br>25.00<br>4.00<br>0.40                  | 11.00   | ND<br>ND<br>ND<br>ND<br>ND<br>ND   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00                            |  |          |
|   | NS<br>ND<br>ND<br>ND<br>ND<br>ND<br>ND<br>ND   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40         | 23.00  | NS ND ND NS NS ND   | 0.80<br>25.00<br>4.00<br>0.40                  | 11.00   | ND<br>ND<br>ND<br>ND<br>ND<br>ND<br>NS                                     | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00                                      | 100.00   |          |
|   | NS ND ND ND ND NS ND ND ND ND  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40         | 23.00  | NTS ND ND ND ND ND NS ND ND ND  | 0.80<br>25.00<br>4.00<br>0.40                  | 11.00   | ND<br>ND<br>ND<br>ND<br>ND<br>ND<br>NS<br>ND                               | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   | 100.00   |          |
|   | NS ND ND ND NS ND NS ND NS ND NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40         | 23.00  | NTS NTD NTD NTD NTD NTD NTS NTD NTD NTS NTD NTS NTD NTS | 0.80<br>25.00<br>4.00<br>0.40                  | 11.00   | ND<br>ND<br>ND<br>ND<br>ND<br>NS<br>ND<br>ND                               | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00                            | 100.00   | 49.00    |
|   | NS ND ND ND NS ND ND NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 23.00  | NTS ND ND ND ND NS NS ND ND NS ND NS ND NS NS NS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 |   | ND<br>ND<br>ND<br>ND<br>ND<br>ND<br>NS<br>ND                               | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   |  | 49.00    |
|   | NS ND ND ND NS ND NS ND NS ND NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40         | 23.00  | NTS NTD NTD NTD NTD NTD NTS NTD NTD NTS NTD NTS NTD NTS | 0.80<br>25.00<br>4.00<br>0.40                  | 140.00  | ND<br>ND<br>ND<br>ND<br>ND<br>NS<br>ND<br>ND                               | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   | 100.00   | 49.00    |
|   | NS ND ND ND ND NS NS ND NS NS NS ND  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 |  | NS ND ND NS ND NS NS NS NS NS   | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00  | ND<br>ND<br>ND<br>ND<br>ND<br>NS<br>ND<br>ND<br>ND<br>ND<br>ND             | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   | 5000.00  |          |
|   | NS ND ND ND NS NS NS ND ND ND ND NS NS ND  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 23.00  | ND ND ND ND ND ND ND ND NS                              | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 |   | ND<br>ND<br>ND<br>ND<br>ND<br>NS<br>ND<br>ND                               | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   |  | 49.00    |
|   | NS ND ND ND ND ND NS NS ND ND NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 |  | NS ND ND NS ND NS NS NS NS NS   | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00  | ND N                                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   | 5000.00<br>mg/l                                |          |
|   | NS ND ND ND NS NS NS ND ND ND ND NS NS ND  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 |  | ND N  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00  | ND ND ND ND NS NS ND NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   | 5000.00  |          |
| 0                                       | NS ND ND ND ND ND NS NS ND ND NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 |  | ND N  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l  | ND ND ND ND NS NS ND NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   | 5000.00<br>mg/l                                |          |
| 90                                      | NS ND ND ND NS NS NS ND ND ND NS NS NS ND ND ND NS NS NS NS ND ND NS | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 |  | NS ND ND ND NS NS NS ND ND ND NS NS NS ND ND ND NS      | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l  | ND ND ND ND NS NS NS NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00<br>5.00<br>100.00<br>1000.00<br>15.00<br>2.00<br>100.00<br>50.00                   | 5000.00<br>mg/l                                |          |
| 90                                      | NS ND ND ND NS NS NS ND ND ND NS NS NS ND ND ND NS NS NS NS ND ND NS | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | mg/1<br>400.00   | NS ND ND ND NS NS NS ND ND ND NS NS NS ND ND ND NS      | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140.00<br>mg/l<br>1400.00<br>160.00<br>90.00  | ND ND ND ND NS NS NS NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 100.00 15.00 2.00 100.00 2.00 2.00 0.00 0.00                    | 5000.00<br>mg/l                                |          |
| 100                                     | NS ND ND ND NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00   | NE N  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400.00   | ND ND ND ND NS NS NS NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00<br>mg/l                                |          |
| 100                                     | NS ND ND ND NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50  | NS ND ND NS NS NS NS NS NS NS   | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400,00<br>160,00<br>90,00<br>0.04  | ND ND ND ND NS NS NS NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 100.00 15.00 2.00 100.00 2.00 2.00 0.00 0.00                    | 5000.00<br>mg/l<br>250.00                      |          |
|   | NS ND ND ND ND NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | mg/1<br>400.00   | NS ND ND NS   | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140.00<br>mg/l<br>1400.00<br>160.00<br>90.00  | ND ND ND ND ND NS NS NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00<br>mg/l                                |          |
| 100                                     | NS ND ND ND NS NS NS NS NS NS ND ND ND NS                            | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 11.60 12.00  | NE N  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140.00<br>mg/l<br>1400.00<br>160.00<br>90.00<br>0.04  | ND ND ND ND NS NS NS NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 250.00<br>0.30                                 |          |
| 0                                       | NS ND ND ND ND NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.00   | NS ND ND NS   | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00   | ND ND ND ND ND NS NS NS NS   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00<br>mg/l<br>250.00                      |          |
|   | NS ND ND NS NS NS NS NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 11.60 12.00  | NS ND ND NS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140.00<br>mg/l<br>1400.00<br>160.00<br>90.00<br>0.04  | ND ND ND ND ND ND ND ND NS NS NS NS NS                                     | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 250.00<br>0.30                                 |          |
|   | NS ND ND NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.00   | NS ND ND NS NS NS NS NS NS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00   | MD MD MD MD MD MD MD MS MD MD MS MS MS MS MS MS MS MS MS                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 250.00<br>0.30                                 |          |
|   | NS ND ND NS NS NS NS NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.00<br>6.84<br>0.04   | NS ND ND NS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00<br>7.10                                       | ND ND ND ND ND ND ND ND NS NS NS NS NS                                     | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00<br>mg/l<br>250.00<br>0.30              |          |
|   | NS ND ND NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 12.00<br>400.00<br>41.60<br>0.50<br>12.00<br>6.84<br>0.04  | NS ND ND NS NS NS NS NS NS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140.00<br>mg/l<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00<br>7.10<br>0.06                               | MD MD MD MD MD MD MD MS MD MD MS MS MS MS MS MS MS MS MS                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00  mg/l  250.00  0.30  6.5-8.5           |          |
| 00 00                                   | NS ND ND NS NS NS NS NS  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.00<br>6.84<br>0.04   | NS ND ND NS NS NS NS NS NS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/1<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00<br>7.10<br>0.06                               | MD MD MD MD MD MD MD MS MD MD MS MS MS MS MS MS MS MS MS                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00<br>mg/l<br>250.00<br>0.30              |          |
|   | NS ND ND ND NS NS NS NS NS NS NS   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 12.00<br>400.00<br>41.60<br>0.50<br>12.00<br>6.84<br>0.04  | HS ND ND NS   | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140.00<br>mg/l<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00<br>7.10<br>0.06                               | NID NID NID NID NID NID NID NID NIS    | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00  mg/l  250.00  0.30  6.5-8.5           |          |
| 00 00                                   | NS ND  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.00<br>6.84<br>0.04   | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/1<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00<br>7.10<br>0.06                               | HD ND ND ND ND ND ND NS                | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00  mg/l  250.00  0.30  6.5-8.5           |          |
| 00 00                                   | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.00<br>6.84<br>0.04   | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/1<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00<br>7.10<br>0.06                               | HD HS | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00  mg/l  250.00  0.30  6.5-8.5           |          |
| 00 00                                   | NS ND  | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 11.00<br>400.00<br>41.60<br>0.50<br>11.00<br>6.84<br>0.04<br>3064.90<br>96.00                            | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400,00<br>160,00<br>90,00<br>111,00<br>7.10<br>0.06<br>4340,00<br>89,00<br>220,00        | HD ND ND ND ND ND ND NS                | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00  256.00  0.30  6.3-8.3  500.00  250.00 |          |
| 00 00                                   | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.00<br>6.84<br>0.04   | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/1<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00<br>7.10<br>0.06                               | HD HS | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00  mg/l  250.00  0.30  6.5-8.5           |          |
| 00 00                                   | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 11.00<br>400.00<br>41.60<br>0.50<br>11.00<br>6.84<br>0.04<br>3064.90<br>96.00                            | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400,00<br>160,00<br>90,00<br>111,00<br>7.10<br>0.06<br>4340,00<br>89,00<br>220,00        | HD H                                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 11000.00 115.00 2.00 30.00 2.00 30.00 2.00 100.00 100.00 100.00 100.00 | 5000.00  256.00  0.30  6.3-8.3  500.00  250.00 |          |
| 000                                     | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00 41.60 0.50 12.00 6.84 0.04 3064.00 370.00 96.00   | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400,00<br>160,00<br>90,00<br>111,00<br>7.10<br>0.06<br>4340,00<br>89,00<br>220,00        | HD HS | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 100.00 15.00 2.00 100.00 50.00 2.00  2.00  2.00  2.00  2.00            | 5000.00  256.00  0.30  6.3-8.3  500.00  250.00 |          |
| 800 80 80 80 80 80 80 80 80 80 80 80 80 | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.90<br>6.84<br>0.04<br>3064.00<br>96.00                                     | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400.00<br>160.00<br>90.00<br>0.04<br>11.00<br>7.10<br>0.06<br>4340.00<br>89.00<br>220.00 | HD H                                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 11000.00 115.00 2.00 30.00 2.00 30.00 2.00 100.00 100.00 100.00 100.00 | 5000.00  256.00  0.30  6.3-8.3  500.00  250.00 |          |
| 000                                     | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00 41.60 0.50 12.00 6.84 0.04 3064.00 370.00 96.00   | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/1<br>1400,00<br>160,00<br>90,00<br>0.04<br>11,00<br>7,10<br>0.06<br>4340,00<br>89,00<br>220,00 | HD H                                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 11000.00 115.00 2.00 30.00 2.00 30.00 2.00 100.00 100.00 100.00 100.00 | 5000.00  256.00  0.30  6.3-8.3  500.00  250.00 |          |
| 800 80 80 80 80 80 80 80 80 80 80 80 80 | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.90<br>6.84<br>0.04<br>3064.00<br>96.00                                     | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400,00<br>160,00<br>90,00<br>0.04<br>11.00<br>7.10<br>0.06<br>4340,00<br>220,00          | HD H                                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 11000.00 115.00 2.00 30.00 2.00 30.00 2.00 100.00 100.00 100.00 100.00 | 5000.00  256.00  0.30  6.3-8.3  500.00  250.00 |          |
| 000                                     | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 11.00<br>400.00<br>41.60<br>9.50<br>11.00<br>6.84<br>0.04<br>370.00<br>96.00<br>17.00<br>38.20<br>400.00 | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00<br>mg/l<br>1400,00<br>160,00<br>90,00<br>0.04<br>11.00<br>7.10<br>0.06<br>4340,00<br>220,00          | HD H                                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 11000.00 115.00 2.00 30.00 2.00 30.00 2.00 100.00 100.00 100.00 100.00 | 5000.00  256.00  0.30  6.3-8.3  500.00  250.00 |          |
| 88 80 80                                | NS N   | 0.80<br>25.00<br>16.00<br>4.00<br>0.40<br>4.00 | 400.00<br>41.60<br>0.50<br>12.90<br>6.84<br>0.04<br>3064.00<br>96.00                                     | HS  | 0.80<br>25.00<br>4.00<br>0.40<br>4.00<br>15.00 | 140,00  mg/l  1400,00  150,00  90,00  111,00  7.10  0.06  4340,00  83.00  220.00  1400,00  1170,00          | HD H                                   | 10.00<br>10.00<br>5.00<br>0.20 | 2000.00 5.00 100.00 11000.00 115.00 2.00 30.00 2.00 30.00 2.00 100.00 100.00 100.00 100.00 | 5000.00  256.00  0.30  6.3-8.3  500.00  250.00 | mg/l     |

|   | Pt   | IV, APR        | 88        | CO                | MP, DEC  |           |                   | MP, MAY  |              |                   | OMP, DEC |               |                   | MP, MAY      |              |                   | MP, JUN  |           |              | IV: WEST    |  | PH III.  |               |
|---|--|----------------|-----------|-------------------|----------|-----------|-------------------|----------|--------------|-------------------|----------|---------------|-------------------|--------------|--------------|-------------------|----------|-----------|--------------|-------------|--|--|---------------|
|   | Res  | ult            | Det Limit | Res               |          | Det Limit | Res               |          | Det Limit    | Res               |          | Det Limit     | Res               |              | Det Limit    | Resi              |          | Det Limit | Res          |             | Det Limit  | Res  |               |
| Volutiles   | ug/l   | ND/NS          |           | ug/l              | ND/NS    |           | ug/l              | ND/NS    |              | ug/1              | ND/NS    |               | ug/l              | ND/NS        |              | ug/l              | ND/NS    |           | ug/1         | ND/NS<br>NS | -  | ug/l   | Z             |
| Acetone   |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS<br>NS     |              | -                 | NS<br>NS |           |              | NS<br>NS    |  |  | +             |
| 2-Butanone  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       | $\rightarrow$ | -                 | NS           |              |                   | NS<br>NS |           | -            | NS<br>NS    | -  |  | H             |
| Carbon Disulfide  |  | NS             |           |                   | NS       |           |                   | NS       |              | -                 | NS       |               |                   | NS           |              |                   | NS<br>NS |           |              | NS NS       | -  |  | ⊢;            |
| Chloromethane   |  | NS NS          |           |                   | NS       |           | -                 | NS<br>NS |              |                   | NS<br>NS | $\overline{}$ |                   | NS<br>NS     |              | -                 | NS<br>NS |           |              | NS NS       |  | -  | <del>  </del> |
| 1.1-Dichloroethane  |  | NS             |           |                   | NS       |           |                   |          |              |                   | NS<br>NS |               |                   | NS NS        |              | $\overline{}$     | NS       |           |              | NS          |  |  | ∺             |
| 1,2-Dichloroethane  |  | NS NS          |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS NS        |              |                   | NS       |           |              | NS          |  |  | $\vdash$      |
| 1,4-Dioxane   |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  |               |
| Ethy (benzene   |  | NS NS          |           |                   | NS<br>NS |           |                   | NS<br>NS |              |                   | NS NS    |               |                   | NS           |              |                   | N5       |           |              | NS          |  |  | -             |
| Methyl Ethyl Ketone (MEK)   |  | NS             |           |                   |          |           |                   | NS<br>NS |              |                   | NS       |               | -                 | NS           |              |                   | NS       |           |              | NS          |  |  | $\vdash$      |
| 4-Methyl-2-Pentanone  |  | NS             |           |                   | NS<br>NS |           |                   | NS<br>NS | -            |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  | -             |
| Methylene Chloride  |  | NS             |           |                   | NS NS    |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  | <b>—</b>      |
| Toluene   |  | NS<br>ND       | 1.00      |                   | ND       | 5.00      | _                 | ND       | 5.00         |                   | ND       | 5.00          |                   | ND           | 20.00        |                   | ND       | 10.00     |              | ND          | 5.00   |  | 1             |
| 1.1.1-Trichloroethane   |  |                | 1.00      | $\overline{}$     | ND       | 5.00      |                   | ND       | 5.00         | -                 | ND       | 5.00          |                   | ND           | 20.00        |                   | ND       | 10.00     |              | ND          | 5.00   |  |               |
| Trichloroethylene   |  | ND             | 1.00      |                   | NS       | 3.00      |                   | NS       | 5.00         |                   | NS       | J.00          |                   | NS           |              |                   | NS       |           |              | NS          |  |  | 1             |
| Trichlorotluoromethane  | -  | NS<br>NS       |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  |               |
| Xylenes (Total)   | <del>-  </del>                                   | N9             |           |                   | 140      |           |                   | 143      | -            |                   | - 110    |               |                   |              |              |                   |          |           |              |             |  |  |               |
| Semi-Volatiles  | ug/i   | ND/NS          |           | ug/l              | ND/NS    |           | ug/l              | ND/NS    |              | ug/l              | ND/NS    |               | ug/l              | ND/NS        |              | ug/l              | ND/NS    |           | ug/l         | ND/NS       |  | ug/l   | N             |
|   |  | NS             |           | -8.               | NS       |           |                   | NS       |              | _                 | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  |               |
| Acenaphthene  | $\vdash$   | NS             |           | _                 | NS       |           | $\overline{}$     | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  |               |
| Acetophenone  | _  | NS             | -         |                   | NS       |           | <del></del>       | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  |               |
| Benzene<br>Benzene  |  | NS NS          |           |                   | NS       |           | <del></del>       | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  |               |
| Benzoic Acid<br>Bis(2-Ethylhexyl)phthalate  | $\vdash$   | NS             |           |                   | NS       |           | 1                 | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  | 匚             |
| 2.4-Dimethylphenol  | <del></del>                                      | NS             |           |                   | NS       |           | $\vdash$          | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS _     |           |              | NS          |  |  |               |
| Di-n-Buty! phthalate  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  | $\Box$        |
| Diethyl Phthalate   |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  | _             |
| Fluoranthene  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  | <del> </del>  |
| Napthalene  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          | $\Box$   |  | ₩             |
| m&p-Creosol   |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          | $\vdash$   |  | $\vdash$      |
| o-Creosol   |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       | ļ         |              | NS          |  |  | ₩             |
| Phenathrene   |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              | $\vdash$          | NS       |           |              | NS          | ₩  |  | ₩             |
| Phenol  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              | -                 | NS       |           |              | NS          |  |  | ╄             |
| Pyrene  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               | -                 | NS           |              |                   | NS       |           |              | NS          |  |  | $\vdash$      |
|   |  |                |           |                   |          |           |                   |          |              | ليسا              |          |               |                   | P(2)         |              |                   | NT OF    |           |              | ND/NS       |  | 11-7   | N             |
| Herbicides/Pesticides   | ид/1   | ND/NS          |           | ug/I              | ND/NS    |           | ug/l              | ND/NS    |              | ug/i              | ND/NS    |               | ug/l              | ND/NS        |              | ug/l              | ND/NS    |           | ug/l         |             |  | ug/l   | ₽,            |
| Alpha-BHC   |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  | ₩             |
| Endrin  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           | -            | -                 | NS       |           |              | NS<br>NS    |  |  | ┿             |
| Dieldrin  |  | NS             |           |                   | NS       |           |                   | NS       |              | -                 | NS       |               |                   | NS           |              | _                 | NS       |           |              | NS<br>NS    | -  | -  | +-            |
| Dimethoate  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS<br>NS     |              |                   | NS       | _         |              |             |  |  | +-            |
| Disulfaton  |  | NS             |           |                   | NS       |           |                   | NS       | -            | <b>—</b>          | NS<br>NS |               |                   | NS<br>NS     | -            |                   | NS<br>NS |           |              | NS<br>NS    | _  | 1  | +-            |
| 2.4.5-T   | L  | NS             |           |                   | NS       |           |                   | NS       |              | <b>├</b> ─        | NS<br>NE |               | <b>—</b>          | NS<br>NS     |              |                   | NS<br>NS |           |              | NS<br>NS    |  | <del>                                     </del> | +-            |
| 2,4-D   | <b></b>  | NS             |           |                   | NS<br>NS |           |                   | NS       | <del> </del> | —                 | NS<br>NS |               |                   | NS<br>NS     |              | _                 | NS<br>NS |           | +            | NS<br>NS    | <del>                                     </del> | <del>                                     </del> | +             |
| HxCDD   | <b>—</b> —                                       | NS             |           | <b>—</b>          | NS       |           |                   | NS<br>NC | <del> </del> | <del></del>       | NS<br>NS |               | 1                 | NS<br>NS     |              | -                 | NS       | -         | <del> </del> | NS NS       | <del></del>                                      |  | +             |
| HxCDF   | -  | NS             |           | -                 | NS       |           |                   | NS       |              |                   | 145      |               |                   | 143          | -            | -                 | .40      | 1         | <b>†</b>     |             | _  |  | +             |
|   | -  | NT AIC         | -         |                   | ND/NS    |           | n-d               | ND/NS    |              | ug/I              | ND/NS    |               | ug/l              | ND/NS        |              | ug/l              | ND/NS    | <b>—</b>  | ug/l         | ND/NS       | <b>†</b>   | ug/l   | N             |
| Heavy Metals  | ug/l   | NDVNS          |           | ug/l              |          |           | ug/l              | NUMS     |              | G#/1              | NS NS    |               | - W               | NS           |              |                   | NS       |           | 1            | NS          | <b>†</b>   | 1  | +-            |
| Antimony  | 40.00  | NS             | -         | 9.00              | NS       |           | 37.00             | No       |              | 57.00             | 143      | -             | 32.00             | 140          | <b></b>      | 63.00             | ,40      | 1         | 42.00        | 1,5         |  | 39.00  |               |
| Arsenic   | 40.00  | ) te           |           | 9.00              | NS       |           | 31.00             | NS       | +            | 37.00             | NS       | <del></del>   | 22.00             | NS           |              | 22.57             | NS       |           | 1            | NS          |  | 1  | T             |
| Barium  | -  | NS<br>ND       | 10.00     | 12.00             | 142      |           | <del></del>       | ND ND    | 1.00         | 24.00             | ,,,,,,   | _             | 14.00             | <u></u>      | t            | 21.00             |          |           | 22.00        |             |  |  | 1             |
| Chemium   | <del></del>                                      | ND             | 10.00     | 23.00             |          |           | 17.00             |          | 1.00         |                   | ND       | 50.00         |                   | ND           | 50.00        | 40.00             |          |           |              | ND          | 40.00  |  |               |
| Corner  | <del></del>                                      | ND             | 10.00     | 50.00             |          |           | 7.00              |          | 1            |                   | ND       | 6.00          | 28.00             |              |              | 25.00             |          |           |              | ND          | 20.00  | 22.00  |               |
| Copper<br>Lead  | <del>                                     </del> | ND             | 5.00      | 70.00             | ND       | 2.00      | 4.00              |          |              |                   | ND       | 2.00          | 12.00             |              |              | 3.00              |          |           | 29.00        |             |  |  | 厂             |
| Mercury   |  | ND             | 0.20      |                   | ND       | 0.20      |                   | ND       | 0.20         |                   | ND       | 0.20          |                   | ND           | 0.20         |                   | ND       | 0.20      |              | ND          | 0.80   |  | 工             |
| Nickel  |  | NS             | 1         |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              |                   | NS       |           |              | NS          |  |  | 1             |
| Selenium  |  | ND             | 5.00      | 3.00              |          |           | 3.00              |          |              | 2.00              |          |               |                   | ND           | 2.00         |                   | ND       | 2.00      |              | ND          | 8.00   | <del></del>                                      | 1             |
| Silver  |  | ND             | 10.00     | 16.00             |          |           | 10.00             |          |              |                   | ND       | 3.00          |                   | ND           | 5.00         | 9.00              |          |           |              | ND          | 32.00  |  | 1             |
| Thallium  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           | 1            |                   | NS       |           |              | NS          | -  |  | $\perp$       |
| Vanadium  |  | NS             |           |                   | NS       |           |                   | NS       |              |                   | NS       |               |                   | NS           |              | -                 | NS       | -         | 1            | NS          | -  | 100  | +             |
| Zinc  | 220.00   |                |           | 62.00             |          |           | 35.00             |          |              | 27.00             | $\bot$   | <u> </u>      | 200.00            |              | ļ            | 27.00             |          |           | 45.00        | +           | +  | 100.00   | +             |
|   |  |                |           |                   |          |           |                   |          | ļ            | <u> </u>          |          |               | -                 |              |              | ļ.,               | NO. 21-  | 1         | 1            | N= 2/-      |  |  | +.            |
| Conventional Parameters   | mg/l   | ND/NS          |           | mg/l              | ND/NS    |           | mg/l              | ND/NS    |              | mg/l              | ND/NS    | <b></b>       | mg/l              | ND/NS        |              | mg/l              | ND/NS    | -         | mg/l         | ND/NS       | +  | mg/l   | +-            |
| Biological Oxygen Demand  |  | NS             |           |                   | NS       |           |                   | NS       |              | 130.00            |          | +             | 67.00             | 1            |              | 68.00             | 710      | -         | -            | NS<br>NS    | +  |  | +             |
| Chemical Oxygen Demand  |  | NS             |           | -                 | NS       |           | 1000              | NS       |              | 1000              | NS       |               | 1000.00           | NS           |              | 990.00            | NS       | -         | 1100.00      | NS          | +  | 1000.00  | +-            |
| Chlorides   | 740.00   | ļ              | <b>—</b>  | 980.00            |          |           | 1000.00           |          | +            | 580.00            | 3.50     | -             | 1000.00           | NIC          | -            | 880.00            | NS       | +         | 1100.00      | NS          | +  | 1000.00  | +-            |
| Cyanide   |  | NS             | -         | 1                 | NS       |           | 1/2.27            | NS       |              | 10000             | NS       | +             | 110.00            | NS           | 1            | 95.00             | N3       | +         | 480.00       | 142         | +  | 460.00   | +-            |
| Ammonia, Nitrogen   | 140.00   |                | 1         | 130.00            |          |           | 140.00            | 100      | +            | 95.00             | N/D      | +             |                   | <del> </del> | +            | 93.00             | ND       | +         | 480.00       | ND          | +  | 400.00   | +             |
| Organic Nitrogen  | 1  | ND             | -         | 10.00             |          |           | 000               | ND       | +            | 0.26              | ND       | +             | 190.00            | <del></del>  | +            | <del> </del>      | ND       | 0.20      | 0.22         | + 40        | +  | 0.18   | +             |
| Nitrate   | 0.01   | 110            | -         | 0.02              | N/0      | -         | 0.02              | NIP.     | +            | 0.40              | NS       | +             | 0.02              | NS           | 1            | +                 | NS       | 0.20      | 7.22         | NS          | _  | 7.10   | +             |
| Nitrite   | 22.00  | NS             |           | 0.73              | NS       | -         | 19.80             | NS       | +            | 33.00             | 142      | +             | 18.00             | 143          | -            | 13.00             | 140      | _         | 4.50         | 110         | 1  | 6.50   | +             |
| lron  | 23.00  |                |           | 0.72              | 3.10     | -         | 19.80             | NS       | +            | 33.00             | NS       | +             | 18.00             | NS           | <del> </del> | 13.00             | NS       | +         | 1.50         | NS          | $\overline{}$                                    | 3.50   | +             |
| Oil and Grease  | 1 (22  | NS             | -         | 7.07              | NS       |           | 7.40              | NS       | +            | 6.70              | Ha2      | +             | +                 | NS<br>NS     | +            | 1                 | NS       | +         | +            | NS          | +  | 1  | +             |
| pH  | 6.75<br>0.08                                     | 1              | +         | 0.03              | 1        | +         | 7.40              | ND       | 0.00         | 0.70              | ND       | 0.01          | <del></del>       | ND           | 0.02         | <b>†</b>          | ND       | 0.01      | 0.06         | T           | 1  | 0.05   | $\top$        |
| Phenois (Total)   | 0.08   | NS             | +         | 0.03              | NS       |           | +                 | NS       | 0.00         | <del></del>       | NS       | + ····        | +                 | NS           | 7.52         | 1                 | NS       | 1         | 1            | NS          |  |  | $\top$        |
| Phosphorus  | +  | NS<br>NS       | +         | +                 | NS<br>NS | +         | +                 | NS<br>NS | +            | _                 | NS       | <del></del>   | +                 | NS.          | 1            |                   | NS       |           |              | NS          | 1  |  | 1             |
| Total Suspended Solids  | 4180.00  | N2             | +         | 4340.00           | No       | -         | 5000.00           |          | +            | 3800.00           |          | +             | 3800.00           | 1.10         | 1            | 4300.00           |          | _         | 4300.00      |             |  | 4300.00  |               |
| Total Dissaburd C-1: J.   | 280.00   | -              | +         | 1100.00           | 1        | -         | 1000.00           |          | +            | 170.00            |          |               | 370.00            |              |              | 220.00            | 1        |           | 48.00        |             |  | 190.00   |               |
| Total Dissolved Solids  | 260.00   | -              |           | 360.00            | +        | +         | 460.00            |          |              | 620.00            |          | 1             | 380.00            | 1            | 1            | 32.00             | T        |           | 400.00       |             |  | 380.00   |               |
| Sulfate   | 400.00   | NS             | +         | 300.00            | NS       | _         | 100.00            | NS       | +            | 020.00            | NS       | <del>1</del>  | 1 30.00           | NS           |              | 1                 | NS       | 1         | 1            | NS          |  |  | $\top$        |
| Sulfate<br>Total Organic Carbon   |  |                |           | -                 | NS<br>NS | +         | +                 | NS<br>NS | +            | +                 | NS<br>NS | +             | 1                 | NS           |              |                   | NS       | 1         | 1            | NS          | 1  |  | $\top$        |
| Sulfate Total Organic Carbon TOC (Duplicate)  |  |                | 1         | -                 | NS<br>NS | 1         | +                 | NS       | +            | 1                 | NS       | 1             |                   | NS           |              |                   | NS       | 1         | 1            | NS          |  |  | $\top$        |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens   |  | NS<br>NS       |           |                   |          | _         | -                 | +        | <b>†</b>     | 6.70              | 1        | 1             | 4.00              | 1            | 1            | 5.00              |          |           | 0.99         | 1           |  | 1.80   | $\top$        |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens Magnesium   | 530  | NS<br>NS       |           | 8.80              | -        |           | 5.07              |          |              |                   |          |               |                   |              |              |                   |          |           |              |             |  |  |               |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens Magnesium Mangenese   | 5.20   | NS             |           | 8.80              |          |           | 5.07              | NS       |              |                   | NS       |               | 1                 | NS           |              |                   | NS       |           |              | NS          |  |  | $\top$        |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens Magnesium Mangenese Potassium                                   | 5.20   | NS<br>NS       |           | 8.80              | NS       |           | 5.07              | NS<br>NS |              | -                 | NS<br>NS |               | -                 | NS<br>NS     | +            |                   | NS<br>NS | -         |              | NS<br>NS    |  | _  | Ŧ             |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens Magnesium Mangenese Potassium Sodium                            | -  | NS<br>NS<br>NS |           |                   | NS<br>NS |           |                   | NS       |              | 1800.00           | NS       |               | 1700.00           | NS           |              | 2100.00           | NS       |           |              |             |  |  | Ŧ             |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens Magnessum Mangenese Potassium Sodium Alkalinity                 | 1500.00  | NS<br>NS<br>NS |           | 1400.00           | NS<br>NS |           | 1600.00           | NS       |              | 1800.00           | NS       |               | 1700.00<br>120.00 | NS           |              | 2100.00<br>235.00 | NS       |           | 210.00       | NS<br>NS    |  | 210.00   | #             |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens Magnessum Mangenese Potassium Sodium Alkalinity Calcium         | 1500.00  | NS<br>NS<br>NS |           | 1400.00<br>270.00 | NS<br>NS |           | 1600.00<br>295.00 | NS       |              | 1800.00<br>250.00 | NS       |               |                   | NS           |              |                   | NS       |           | 210.00       | NS<br>NS    |  | 210.00<br>1400.00                                |               |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens Magnestum Mangerse Potassium Sodium Alkalinity Calcium Hardness | 1500.00  | NS<br>NS<br>NS |           | 1400.00           | NS<br>NS |           | 1600.00           | NS       |              | 1800.00           | NS       |               | 120.00            | NS           |              | 235.00            | NS       |           |              | NS<br>NS    |  |  |               |
| Sulfate Total Organic Carbon TOC (Duplicate) Total Organic Halogens Magnessum Mangenese Potassium Sodium Aklatinity Caleium         | 1500.00  | NS<br>NS<br>NS |           | 1400.00<br>270.00 | NS<br>NS |           | 1600.00<br>295.00 | NS<br>NS |              | 1800.00<br>250.00 | NS<br>NS |               | 120.00            | NS           |              | 235.00            | NS       |           |              | NS<br>NS    |  |  |               |

| Res         |          | (10/90)<br>Det Limit                             | Res     |             | (19/90)<br>Det Limit | Res           |              | l/90)<br>Det Limit                               | Res      |       | 9/96)<br>Det Limit | Primary<br>MCL                                   | Secondary<br>MCL | Guidane<br>Conc |
|-------------|----------|--|---------|-------------|----------------------|---------------|--------------|--|----------|-------|--------------------|--|------------------|-----------------|
| ug/l        | ND/NS    |  | ug/l    | ND/NS       |                      | ug/l          | ND/NS        |  | wg/l     | ND/NS |                    | ug/l   | ug/l             | ug/i            |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 700.00          |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 4200.0          |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 700.00          |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 2.70            |
|             | NS       | $\overline{}$                                    |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 700.00          |
|             | NS       | _  |         | NS          |                      |               | NS           |  |          | NS    |                    | 3.00   |                  |                 |
| _           | NS       |  |         | NS          | -                    | $\overline{}$ | NS           |  |          | NS    |                    |  |                  | 5.00            |
|             |          |  | -       | NS          |                      |               | NS           |  |          | NS    |                    |  | 700.00           |                 |
| _           | NS       |  |         | NS NS       | _                    | -             | NS           |  |          | NS    |                    |  | 700.00           | 4200.0          |
|             | NS       |  |         |             |                      |               |              |  |          | NS NS |                    | _  |                  | 4200.0          |
|             | NS       |  |         | NS          |                      |               | NS           |  |          |       |                    | 600  |                  |                 |
|             | NS       | $\rightarrow$                                    |         | NS          |                      |               | NS           |  |          | NS    |                    | 5.00   |                  | -               |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  |                 |
|             | ND       | 5.00   |         | ND          | 5.00                 |               | ND           | 5.00   |          | ND    | 5.00               | 200.00   |                  |                 |
|             | ND       | 5.00   |         | ND          | 5.00                 |               | ND           | 5.00   |          | ND    | 5.00               | 3.00   |                  |                 |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 2100.0          |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    | 10000.00   |                  |                 |
| ug/l        | ND/NS    | -+   | ug/l    | ND/NS       |                      | ug/l          | ND/NS        |  | ug/l     | ND/NS |                    | ug/l   | ug/l             | ug/l            |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 20.00           |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 700.0           |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    | 1.00   |                  |                 |
|             | NS       |  |         | NS          | $\overline{}$        |               | NS           |  |          | NS    |                    |  |                  | 28000.0         |
|             | NS NS    |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  |                 |
|             | NS NS    |  |         | NS          | _                    |               | NS           |  |          | NS    |                    | $\overline{}$                                    |                  | 400.0           |
|             | NS NS    |  |         | NS NS       |                      |               | NS           |  |          | NS    |                    | $\vdash$   |                  | 700.0           |
|             |          |  |         | NS NS       |                      |               | NS NS        |  |          | NS    |                    | <b></b>  |                  | 5600.0          |
|             | NS       |  |         |             | $\overline{}$        |               |              |  |          | NS    |                    | -  |                  | 280.0           |
|             | NS       |  |         | NS          |                      |               | NS           |  |          |       |                    | _  |                  |                 |
|             | NS       |  |         | NS.         |                      |               | NS           |  |          | NS    |                    | <b></b>  |                  | 6.80            |
|             | NS       | I  |         | NS          |                      |               | NS           |  |          | NS    |                    | <b> </b>   |                  | 35.00           |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    | <u> </u>           |  |                  | 350.0           |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 10.00           |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 10.00           |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 210.0           |
| ug/l        | ND/NS    |  | ug/l    | ND/NS       |                      | ug/l          | ND/NS        |  | ug/l     | ND/NS | -                  | ug/l   | ug/I             | ug/l            |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 0.05            |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    | 2.00   |                  |                 |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 0.10            |
|             | NS       |  | -       | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 5.00            |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 0.50            |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    | $\overline{}$                                    |                  | 70.00           |
|             | NS       |  |         | NS          |                      |               | NS           |  | -        | NS    |                    | 70.00  |                  | 1               |
|             |          |  |         | NS          |                      |               | NS           |  | _        | NS    |                    |  |                  |                 |
|             | NS<br>NS |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  |                 |
|             | 143      |  |         | 143         |                      |               | 149          |  |          | - 110 |                    |  |                  |                 |
| ug/i        | ND/NS    |  | ug/l    | NDAS        |                      | ug/l          | ND/NS        |  | ug/l     | ND/NS |                    | ug/l   | ug/l             | ug/l            |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    | 6.00   |                  | <u> </u>        |
| 42.00       | 140      |  | 39.00   | 110         |                      |               | ND           | 71.00  | 41.00    |       |                    | 50.00  |                  |                 |
| 44.00       | NS       |  | 37.00   | NS          |                      |               | NS           | 7 11.00  |          | NS    |                    | 2000.00  |                  |                 |
| 12.00       | 143      |  |         |             | 3.00                 | 54.00         | 140          |  | 7.00     | .,,,, |                    | 5.00   |                  | _               |
| 22.00       |          |  |         | ND          | 2.00                 | 34.00         | 100          | 100.00   |          |       |                    | 100.00   |                  | _               |
|             | ND       | 40.00  |         | ND          | 40.00                |               | ND           | 100.00   | 15.00    |       |                    | 1000.00  |                  |                 |
|             | ND       | 20.00  | 22.00   |             |                      |               | ND           | 50.00  | 8.60     | 100   | 3.00               |  |                  | +               |
| 29.00       |          |  |         | ND          | 20.00                | 12.00         |              |  |          | ND    | 2.00               | 15.00  |                  | ─               |
|             | ND       | 0.80   |         | ND          | 0.80                 |               | ND           | 0.80   |          | ND    | 0.80               | 2.00   |                  | -               |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    | 100.00   |                  | -               |
|             | ND       | 8.00   |         | ND          | 8.00                 |               | ND           | 20.00  |          | ND    | 20.00              | 50.00  |                  |                 |
|             | ND       | 32.00  |         | ND          | 32.00                |               | ND           | 8.00   | 19.00    |       |                    |  | 100.00           |                 |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    | 2.00   |                  |                 |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    | L  |                  | 49.00           |
| 45.00       |          |  | 100.00  |             |                      |               | ND           | 70.00  | 28.00    |       |                    | —  | 5000.00          |                 |
| <b>—</b> -4 | ND/NS    |  | mg/l    | ND/NS       | <b></b>              | mg/l          | ND/NS        |  | m:g/l    | ND/NS | -                  | mg/l   | mg/l             | ing/l           |
| mg/l        | NS       |  |         | NS          | <b>-</b>             | <u> </u>      | NS           |  |          | NS    |                    |  |                  |                 |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    | I                  |  |                  |                 |
| 1100.00     | 1        |  | 1000.00 |             |                      | 630.00        |              |  | 580.00   |       |                    |  | 250.00           |                 |
|             | NS       |  |         | NS          | İ                    |               | NS           |  |          | NS    |                    | 0.20   |                  |                 |
| 480.00      |          |  | 460.00  |             |                      | 37.00         |              |  | 250.00   |       |                    |  |                  | $\vdash$        |
|             | ND       |  |         | ND          |                      | 21.00         |              |  |          | ND    |                    |  | <u> </u>         | +               |
| 0.22        |          |  | 0.18    |             |                      | 0.17          |              |  |          | ND    | 0.10               | 10.00  |                  |                 |
|             | NS       |  |         | NS          |                      |               | NS           |  | 1        | NS    |                    | 1.00   |                  | -               |
| 4.50        |          |  | 6.50    |             |                      | 14.00         |              |  | 32.00    |       | -                  |  | 0.30             | +               |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    | -                  |  |                  | +               |
|             | NS       |  |         | NS          |                      | L             | NS           |  |          | NS    |                    |  | 6.5-8.5          | _               |
| 0.06        |          |  | 0.05    |             |                      | 0.33          |              |  | 0.04     |       |                    |  |                  |                 |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  | 1               |
|             | NS       |  |         | NS          |                      |               | NS           |  |          | NS    |                    |  |                  |                 |
| 4300.00     |          |  | 4300.00 |             |                      | 4600.00       |              |  | 1400.00  |       |                    |  | 500.00           |                 |
| 48.00       |          |  | 190.00  |             |                      | 440.00        |              |  | 360.00   |       | 1                  | I  | 250.00           |                 |
| 400.00      |          |  | 380.00  | 1           | 1                    | 450.00        |              | 1  | 240.00   | T     |                    | 1  |                  | T               |
| 400.00      | NS       | <del>                                     </del> | 200.00  | NS          | <u> </u>             | 1.50.00       | NS           |  | 1        | NS    |                    | 1  |                  | $\overline{}$   |
|             |          |  |         |             | +                    |               | NS           | <del>                                     </del> | <b>†</b> | NS    |                    | <b>T</b>   | <b>1</b>         | $\overline{}$   |
|             | NS<br>NS | -  |         | NS          | -                    | -             |              | +  | -        | NS    | +                  | <del>                                     </del> |                  | $\overline{}$   |
|             | NS       |  |         | NS          |                      | / 22          | NS           | -  | 7.00     | NS    | +                  | $\vdash$   | 0.05             | +               |
| 0.99        |          |  | 1.80    |             |                      | 4.60          |              |  | 7.40     |       | 1                  | -  | 0.05             | +               |
|             | NS       |  |         | NS          |                      |               | NS           |  | _        | NS    | L                  | 1  | L                | +               |
|             | NS       |  |         | NS          |                      | L             | NS           |  |          | NS    |                    | 160.00   |                  |                 |
|             | NS       |  | 1       | NS          |                      | T             | NS           | 1  | T        | NS    |                    |  |                  |                 |
| 210.00      | 140      | <del> </del>                                     | 210.00  | 110         | t —                  | 300.00        | 1            |  | 170.00   |       | 1                  | T  |                  | T               |
| 1400.00     | -        | +  | 1400.00 | <del></del> | +                    | 2200.00       | <del> </del> | <del></del>                                      | 1400.00  |       | +                  | 1  |                  | 1               |
|             |          | -  | 1400.00 | 210         |                      | 2200.00       | NS           |  | 1400.00  | NS    | -                  | 1  |                  | 0.6             |
| 1400.00     |          |  |         | NS          |                      |               | I No         | 1  |          | 1 149 |                    |  |                  | 1 0.0.          |
| 1400.00     | NS<br>NS |  |         | NS          |                      | -             | NS           |  | 1        | NS    |                    |  |                  |                 |

Table A.33: Characteristics of the Sanifill Landfills of Houston, Texas.

LANDFILL:

Houston Landfills, Texas.

OWNER/OPERATOR:

Sanifill Inc.

Houston, Texas.

LITERATURE SOURCE:

Properties of Leachate from Construction/Demolition Waste

Landfills

James M. Norstrom, Charles E. Williams, and Paul A. Pabor. In Proceedings Fourteenth Annual Madison Waste Conference,

Sept 25-26, 1991.

WASTE TYPE:

Construction waste and demolition debris. Includes in descending

order of % volume: wood brush, and grass; concrete, rock, asphalt, and soil; paper and cardboard; metal, rubber, plastic, and

glass.

ACREAGE:

Unknown.

YEARS IN SERVICE:

Opened in mid to late 1980's.

LINER SYSTEM:

Yes.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Leachate sample taken from leachate wells developed at each of the landfills for this study. Approximate depth to the bottom of the wells from the top of the landfills ranged from 23 to 60 feet.

MISCELLANEOUS:

The investigators sampled leachate from three C&D landfills owned by Sanifill and located in Houston Texas. Two samples were taken from each landfill and analyzed for a variety of parameters. Only the minimum and maximum analytical results were presented in the

report.

|                            | 8       | Minimum  | Det 7 | 2       | Maximum | Det I Imit | Primary<br>MCI. | Secondary<br>MCI. | Guidance |
|----------------------------|---------|----------|-------|---------|---------|------------|-----------------|-------------------|----------|
| Volatiles                  | N Van   | ND/NS    |       | N Van   | ND/NS   |            | l/dn            | /ån               | /dn      |
| Acetone                    |         | SN       |       | Т       | SN      |            |                 |                   | 700.00   |
| 2-Butanone                 |         | SN       |       |         | NS      |            |                 |                   | 4200.00  |
| Carbon Disulfide           |         | SZ       |       |         | SN      |            |                 |                   | 700.00   |
| Chloromethane              |         | SN       |       |         | SN      |            |                 |                   | 2.70     |
| 1 1-Dichloroethane         |         | SN       |       |         | SZ      |            |                 |                   | 700.00   |
| 2-Dichloroethane           |         | SN       |       |         | SN      |            | 3.00            |                   |          |
| 1 4-Dioxane                |         | NS       |       |         | NS      |            |                 |                   | 5.00     |
| nylbenzene                 |         | NS       |       |         | SN      |            |                 | 700.00            |          |
| Mathyl Ethyl Ketone (MFK)  |         | SN       |       |         | NS      |            |                 |                   | 4200.00  |
| A Mathyd 2 Dentanone       |         | SZ       |       |         | NS      |            |                 |                   |          |
| A chalant Chlorida         |         | SN       |       |         | SN      |            | 2.00            |                   |          |
| eniviene Choride           | Ī       | 01%      |       |         | No.     |            | 1000 00         |                   |          |
| Toluene                    |         | S.       |       |         | DIA.    |            | 3000            |                   |          |
| , I-trichloroethane        |         | N.       |       |         | 201     |            | 200.00          |                   |          |
| ichloroethylene            |         | SN       |       |         | SZ SZ   |            | 3.00            |                   | 2100.00  |
| Trichlorofluoromethane     |         | SN       | Ī     |         | 2       |            | 000001          |                   | 7100.00  |
| Xylenes (Total)            |         | SZ.      | T     |         | CN.     |            | 10000.00        |                   |          |
|                            |         | The same |       | 0.00    | NTD/MG  |            | ,,,,,           | Upin              | U are    |
| Semi-Volatiles             | I M     | SUMN     |       | 120     | CNICA   |            | 3               | .8                | 00.00    |
| enaphthene                 |         | N.       |       |         | av.     |            |                 |                   | 2000     |
| Acetophenone               |         | SN       |       |         | 2       |            |                 |                   | 700.00   |
| Benzene                    |         | S        |       |         | NS      |            | 1.00            |                   |          |
| nzoic Acid                 |         | NS       |       |         | NS      |            |                 |                   | 28000.00 |
| Bis(2-Ethylhexyl)phthalate |         | SN       |       |         | NS      |            |                 |                   |          |
| 4-Dimethylphenol           |         | NS       |       |         | NS      |            |                 |                   | 400.00   |
| Die Dutyl phtholote        |         | SZ       |       |         | NS      |            |                 |                   | 700.00   |
| ar Dury pinness            |         | NIG      |       |         | 22      |            |                 |                   | 5600.00  |
| Demyi Phuadate             |         | GN.      |       |         | NIC     |            |                 |                   | 280 00   |
| Fluoranthene               |         | GN.      |       |         | 217     |            |                 |                   | 9        |
| Napthalene                 |         | SZ.      |       |         | Z.      |            |                 |                   | 30.0     |
| m&p-Creosol                |         | SZ       |       |         | Z       |            |                 |                   | 33.00    |
| n-Creosol                  |         | NS       |       |         | NS      |            |                 |                   | 320.00   |
| Phenathrene                |         | NS       |       |         | NS      |            |                 |                   | 10.00    |
| Phenol                     |         | SN       |       |         | NS      |            |                 |                   | 10.00    |
| Рутепе                     |         | NS       |       |         | NS      |            |                 |                   | 210.00   |
|                            |         |          |       |         |         |            |                 |                   |          |
| Horbicides/Pesticides      | l/an    | ND/NS    |       | l∕än    | ND/NS   |            | /ân             | l/gu              | /ån      |
| of our                     |         | SZ.      |       |         | SN      |            |                 |                   | 0.05     |
| Aprila-bric                |         | 514      |       |         | 82      |            | 2 00            |                   |          |
| Endrin                     |         | O.V.     |       |         | NIG     |            |                 |                   | 010      |
| Dieldrin                   |         | 2 S      |       |         | CN      |            |                 |                   | 90       |
| Dirnethoate                |         | SZ       |       | -       | NZ.     |            |                 |                   | 20.5     |
| Disulfoton                 |         | SZ       |       |         | SZ      |            |                 |                   | 0.30     |
| 2,4,5-T                    |         | SN       |       |         | NS      |            |                 |                   | 70.00    |
| 4-0                        |         | SN       |       |         | SN      |            | 70.00           |                   |          |
| U-1,2                      |         | Me       |       |         | 22      |            |                 |                   |          |
| KCDD                       |         | CN       |       |         | 014     |            |                 |                   |          |
| (CDF                       |         | n<br>Z   |       |         | CV.     |            |                 |                   |          |
|                            |         |          |       |         |         |            |                 |                   |          |
| Heavy Metals               | 1/3n    | ND/NS    |       | ug/l    | ND/NS   |            | ug/l            | ng/l              | ng/l     |
| Antimony                   |         | SN       |       |         | SN      |            | 00.9            |                   |          |
| Areanio                    | 17 00   |          |       | 75.00   |         |            | \$0.00          |                   |          |
| onice                      | 1500 00 |          |       | 8000 00 |         |            | 2000.00         |                   |          |
| mura                       | 00.0001 |          |       | 00.05   |         |            | 9               |                   |          |
| Cadmum                     | 00.02   |          |       | 20.00   |         |            | 100 001         |                   |          |
| hrominn                    | 100.00  |          |       | 730.00  |         |            | 100.00          |                   |          |
| Copper                     | 140.00  |          |       | 490.00  |         |            | 1000.00         |                   |          |
| Lead                       | 220.00  |          |       | 2130.00 |         |            | 15.00           |                   |          |
| Mercury                    |         | QN       | 2.00  | 9.00    |         | 2.00       | 2.00            |                   |          |
| ickel                      |         | NS       |       |         | SN      |            | 100.00          |                   |          |
| Selenium                   |         | QN       | 1.00  |         | QN      | 1.00       | \$0.00          |                   |          |
|                            |         | Ç.       | 10.00 | 30.00   |         | 10.00      |                 | 100.00            |          |
| Silver                     |         | 21.      | 20.04 |         | N.I.O.  |            | 00.6            |                   |          |
| Lhallwin                   |         | O. S.    |       |         | 57.4    |            |                 |                   | 49.00    |
| Vanadium                   |         | SZ.      |       | 0000000 | 500     |            |                 | 9                 |          |
| Zinc                       | 1700.00 |          |       | 8030.00 |         |            |                 | 3000.00           |          |
|                            |         |          |       |         |         |            | 1               |                   | 1        |
| Conventional Parameters    | /am     | ND/NS    |       | mg/l    | ND/NS   |            | mg/l            | m gyl             | m G      |
|                            |         |          |       |         |         |            |                 |                   |          |

| Bantum                          | 1500.00 |       |       | 8000.00  |       |       | 00.0004 |          | I     |  |
|---------------------------------|---------|-------|-------|----------|-------|-------|---------|----------|-------|--|
| Cadmium                         | 20.00   |       |       | 30.00    |       |       | 2.00    |          |       |  |
| Chromiun                        | 100.00  |       |       | 250.00   |       |       | 100.00  |          |       |  |
| Copper                          | 140.00  |       |       | 490.00   |       |       | 1000.00 |          |       |  |
| Lead                            | 220.00  |       |       | 2130.00  |       |       | 15.00   |          |       |  |
| Mercury                         |         | ΩN    | 2.00  | 00.6     |       | 2.00  | 2.00    |          |       |  |
| Nickel                          |         | NS    |       |          | NS    |       | 100.00  |          |       |  |
| Selenum                         |         | QN    | 1.00  |          | ND    | 1.00  | 20.00   |          |       |  |
| Silver                          |         | ΩN    | 10.00 | 30.00    |       | 10.00 |         | 100.00   |       |  |
| Thallium                        |         | SN    |       |          | NS    |       | 2.00    |          |       |  |
| Vanadium                        |         | SN    |       |          | NS    |       |         |          | 49.00 |  |
| Zinc                            | 1700.00 |       |       | 8630.00  |       |       |         | \$000.00 |       |  |
|                                 |         |       |       |          |       |       |         |          |       |  |
| Conventional Parameters         | l/gm    | SN/QN |       | mg/l     | ND/NS |       | l/gm    | mg/l     | me/   |  |
| Biological Oxygen Demand        | 100.00  |       |       | 320.00   |       |       |         |          |       |  |
| Chemical Oxygen Demand          | 3080.00 |       |       | 11200.00 |       |       |         |          |       |  |
| Chlorides                       | 125.00  |       |       | 240.00   |       |       |         | 250.00   |       |  |
| Cyanide                         |         | ΩN    | 0.10  |          | ΩN    | 0.10  | 0.20    |          |       |  |
| Amnonia, Nitrogen               | 30.00   |       |       | 184.00   |       |       |         |          |       |  |
| Organic Nitrogen                |         | NS    |       |          | NS    |       |         |          |       |  |
| Nitrate                         | 4.00    |       |       | 13.00    |       |       | 10.00   |          |       |  |
| Nitrite                         |         | QN    |       |          | QN    |       | 1.00    |          |       |  |
| Iron                            | 29.00   |       |       | 172.00   |       |       |         | 0.30     |       |  |
| Oil and Grease                  | 18.00   |       |       | 47.00    |       |       |         |          |       |  |
| Н                               | 6.50    |       |       | 7.30     |       |       |         | 6.8-8.5  |       |  |
| Phenols (Total)                 | 0.70    |       |       | 2.99     |       |       |         |          |       |  |
| Phosphorus                      | 2.50    |       |       | 3.89     |       |       |         |          |       |  |
| Total Suspended Solids          | 1000.00 |       |       | 43000.00 |       |       |         |          |       |  |
| Total Dissolved Solids          | 2412.00 |       |       | 4270.00  |       |       |         | \$00.00  |       |  |
| Sulfate                         |         | ND    | 40.00 |          | ND    | 40.00 |         | 250.00   |       |  |
| Total Organic Carbon            | 16.00   |       |       | 1080.00  |       |       |         |          |       |  |
| TOC (Duplicate)                 |         | NS    |       |          | NS    |       |         |          |       |  |
| Total Organic Halogens          |         | NS    |       |          | NS    |       |         |          |       |  |
| Magnesiun                       | 92.00   |       |       | 192.00   |       |       |         |          |       |  |
| Mangenese                       | 1.00    |       |       | 4.90     |       |       |         | 0.05     |       |  |
| Potassium                       | 118.00  |       |       | 618.00   |       |       |         |          |       |  |
| Sodium                          | 256.00  |       |       | 1290.00  |       |       | 160.00  |          |       |  |
| Alkalinity                      | 1710.00 |       |       | 6520.00  |       |       |         |          |       |  |
| Calcium                         | 148.00  |       |       | 578.00   |       |       |         |          |       |  |
| Hardness                        | 597.00  |       |       | 1516.00  |       |       |         |          |       |  |
| Boron                           | 1.40    |       |       | 3.90     |       |       |         |          | 0.63  |  |
| Specific Conductance (untho/cm) | 2920.00 |       |       | 6850.00  |       |       |         |          |       |  |
|                                 |         |       |       | ĺ        |       |       |         |          |       |  |

NB - Not Sampled
ND - Not Detected
Det Limit. Sampling Detection Limit
MCL. Maximum Contaminant Level: Enforceable Groundwater Standards
MCL. Assimum Contaminant Level: Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level: Enforceable Groundwater Standards
Guid...ec Concontrations Not Enforceable Standards

Table A.35: Characteristics of the SKB Rich Valley Demolition Waste Facility, Minnesota.

LANDFILL: SKB Rich Valley Demolition Waste Management Facility,

Minnesota.

OWNER/OPERATOR: SKB Demolition Waste Disposal.

251 Starkey Street

St. Paul, Minnesota 55107

LITERATURE SOURCE: Potential for Environmental Impairment at the SKB Rich Valley

Demolition Waste Management Facility Prepared by Interpoll Laboratories for SKB Demolition Waste Disposal

WASTE TYPE: Construction waste and demolition debris. This includes concrete,

brick asphalt, stucco, rock/gravel, metal, roofing, wood etc. Garbage, yard wastes, liquids, septic tank pumping, tires, appliances, and fertilizers are prohibited at the facility.

ACREAGE: 69 acres.

YEARS IN SERVICE: Opened in August 1989.

LINER SYSTEM: Two foot compacted clay liner with three foot protective drainage

layer.

LEACHATE SYSTEM: Leachate collection system installed consisting of PVC collection

pipes and lift station. Leachate disposed of off-site.

LEACHATE SAMPLE: Leachate sampled from leachate collection system.

MISCELLANEOUS: Groundwater contamination in the area surrounding the facility

existed prior to opening the facility. Notably, drinking water quality criteria for iron, manganese and total dissolved solids were

exceeded in baseline groundwater samples.

Table A.36: Sampling for the SKB Rich Valley Landfill of Maryland.

|                            | Spri  | ng 199     | 1     | Sum   | mer 1990   | Det Limit | Result    |        | Det 14mit | Resu      | 22     | Det Limit | Sum<br>Result | Summer 1992<br>esult | Det Limit | Primary<br>MCL | Secondary | Guldane  |
|----------------------------|-------|------------|-------|-------|------------|-----------|-----------|--------|-----------|-----------|--------|-----------|---------------|----------------------|-----------|----------------|-----------|----------|
| Polotica                   | ho/   | N/C        |       | 100   | DANS       |           | Von       | SN/QN  |           | l/an      | ND/NS  |           | 1/3n          | ND/NS                |           | l/dn           | l/än      | l/an     |
| outnies                    | An.   | 2          | 00.01 | 4     | Silver     | 1         |           | Nie    |           |           | No.    | T         |               | SZ.                  |           |                |           | 700.00   |
| Acetone                    |       | Q S        | 10:00 |       | NS         |           |           | No.    |           | $\dagger$ | SN SN  | T         |               | SN                   |           | Ī              |           | 4200.00  |
| 2-Butanone                 |       | S.         |       |       | CN.        |           |           | CNI    |           |           | 2 2    | T         |               | NIG                  |           | Ì              |           | 2000     |
| Carbon Disulade            |       | SZ.        |       |       | ev.        |           |           | 201    | Ì         | T         | 012    | T         |               | NIG                  |           | T              |           | 2 70     |
| Chloromethane              |       | ž Š        | 90.   |       | SIN SIN    | $\dagger$ | $\dagger$ | 2 0 2  | T         | T         | SN SN  | T         |               | 200                  |           |                |           | 200 00   |
| , I-Dictionoethane         |       | 2 5        | 20.1  |       | CN S       | l         | $\dagger$ | 012    | T         |           | OI4    | T         |               | SZ.                  | Ī         | 300            |           |          |
| 1,2-Dichioroethane         |       | Q S        | 3     |       | S. S.      |           | $\dagger$ | 2012   | T         | T         | 2 2    | T         |               | 2 2                  |           |                |           | 80       |
| 1,4-Dioxaite               |       | 2          |       |       | 2 5        |           | +         | CN.    | t         |           | No.    | Ť         | Ī             | No.                  |           | T              | 200 00    |          |
| Ethylbenzene               |       | Q          | 1.00  |       | N.         | 1         | 1         | No.    | 1         |           | e s    | Ì         |               | S S                  |           |                | 8.80      | 4700 00  |
| fethyl Ethyl Ketone (MEK)  |       | Ð          | 5.00  |       | SN         | 1         | 1         | NN     | 1         |           | 2      |           |               | 2 5                  | Ī         |                |           | 4500.0   |
| -Methyl-2-Pentanone        |       | NS         |       |       | NS         |           |           | NS     |           |           | NS     | 1         |               | SS                   | 1         |                |           |          |
| Methylene Chloride         | 5.00  |            |       |       | SN         |           |           | SN     |           |           | NS     |           |               | NS                   |           | 5.00           |           |          |
| Tohene                     |       | Q          | 1.00  |       | SZ         |           |           | NS     |           |           | NS     |           |               | NS                   |           | 1000.00        |           |          |
| 1.1 Tricklescathers        | 1 00  |            |       |       | SZ.        |           |           | SZ     |           |           | SN     |           |               | SZ                   |           | 200.00         |           |          |
| 1,1-1 nemer centarie       | 30.1  | 24.        |       |       | 2014       | +         |           | MG     |           |           | NIG    |           |               | NA                   |           | 3.00           |           |          |
| Frichloroethylene          |       | SZ         |       |       | Z          |           | 1         | CZ!    | 1         | 1         | CN.    |           |               | 2 2                  |           | 3              |           | 2100 00  |
| Trichlorofluoromethane     | 20.00 |            |       |       | NS         |           |           | NS     |           |           | Z Z    | 1         | 1             | Z                    |           |                |           | 7100.0   |
| Xvlenes (Total)            |       | NS         |       |       | SZ         |           |           | NS     |           |           | NS     |           |               | NS                   |           | 10000.00       |           |          |
|                            |       |            |       |       |            |           |           |        |           |           |        |           |               |                      |           |                |           |          |
| Somi-Volatiles             | l/on  | SN/CN      |       | l/on  | SN/GN      |           | l/an      | ND/NS  |           | l/an      | ND/NS  |           | l/an          | ND/NS                |           | /an            | San       | /an      |
| the remains                |       | NIG        |       |       | NA.        | $\dagger$ | ۲         | SN     |           |           | NS     |           |               | NS                   |           |                |           | 20.00    |
| Acenaphinene               |       | CAL.       |       |       | 274        | T         |           | Nie    | T         | T         | 87     |           |               | 82                   |           |                |           | 700.00   |
| Acetophenone               |       | 2          |       |       | 2          |           | 1         | 2 3    | †         | l         | 2 5    | T         | Ī             |                      |           | 90             |           |          |
| Benzene                    |       | NS         |       |       | NS         |           | 1         | NS     |           |           | SZ     |           |               | 2                    |           | 30:1           |           | 0000     |
| Benzoic Acid               |       | SN         |       |       | SN         |           |           | NS     |           |           | NS     |           |               | SN                   |           |                |           | 28000.00 |
| Ris(2-Ethylhexyl)nhthalate |       | SN         |       |       | SN         |           |           | NS     |           |           | NS     |           |               | NS                   |           |                |           |          |
| 4 Dimethylphanol           |       | 22         |       |       | SZ.        |           |           | NS     |           |           | SZ     |           |               | NS                   |           |                |           | 400.00   |
| 2,4-Duneuryphench          |       | 2 2        |       |       | ol v       |           |           | NG     | Ī         |           | vZ     |           |               | SZ.                  |           |                |           | 700.00   |
| Di-ri-Butyl phthalate      |       | CZ.        |       |       | GNI<br>STA |           | $\dagger$ | 21.    | T         |           | 92     |           |               | o Z                  | Ī         |                |           | \$600.0  |
| iethyl Phthalate           |       | S.         |       |       | CZ.        |           | $\dagger$ | C.     |           | T         | 2 2    | Ť         |               | 014                  |           |                |           | 280 04   |
| Fluoranthene               |       | NS         |       |       | NS         | 1         |           | SZ     |           |           | SZ     | 1         |               | CN                   |           |                |           | 0000     |
| Napthalene                 |       | NS         |       |       | NS         |           |           | NS     |           |           | NS     |           |               | SZ                   |           |                |           | 0.80     |
| m&p-Creosol                |       | NS         |       |       | NS         |           |           | SN     |           |           | NS     |           |               | NS                   |           |                |           | 35.00    |
| Creosol                    |       | SN         |       |       | SN         |           | _         | NS     |           |           | SN     |           |               | NS                   |           |                |           | 350.0    |
| Discontinuo                |       | 2          |       |       | SZ         |           |           | SZ     |           |           | NS     |           |               | SN                   |           |                |           | 10.00    |
| Dissol                     |       | S N        |       |       | SZ         |           | l         | SN     |           |           | SN     |           |               | NS                   |           |                |           | 10.00    |
| iono.                      |       | NIG        |       |       | NA         |           | -         | S.Z    |           |           | NS     |           |               | NS                   |           |                |           | 210.0    |
| ryiene                     |       | 2          |       |       |            | t         | T         |        |           |           |        |           |               |                      |           |                |           |          |
|                            |       | 17.41.41.4 |       |       | NIP OTO    | $\dagger$ | t         | OWN    |           | /61       | SNUN   |           | /an           | SN/CZ                |           | 1/611          | l/an      | l/dn     |
| Herbicides/Pesticides      | ng,   | SN/ON      |       | ngn   | NUM        | 1         | 100       | CNICA  |           | i a       | SVION. |           |               | 210                  |           |                |           | 0.00     |
| Alpha-BHC                  |       | SS         |       |       | NS         | 1         |           | z<br>Z | 1         |           | SZ.    | 1         |               | e s                  |           | 90             |           | 6.5      |
| Endrin                     |       | NS         |       |       | NS         |           |           | SN     |           | 1         | SZ     | 1         |               | 2                    |           | 30.7           |           | 1        |
| Dieldrin                   |       | SN         |       |       | NS         |           |           | NS     |           |           | SS     |           |               | SN                   |           |                |           | 0.10     |
| Dimethoate                 |       | SN         |       |       | SN         |           | _         | NS     |           |           | NS     |           |               | NS                   |           |                |           | 2.00     |
| inelitation                |       | ž          |       |       | SZ         |           |           | SZ     |           |           | SZ     |           |               | NS                   |           |                |           | 0.50     |
| Distriction                |       | 2 24       |       |       | 22         | t         |           | SZ     |           | T         | SN     |           |               | SN                   |           |                |           | 70.00    |
| 2,4,3-1                    |       | CA1        |       |       | N. Co.     |           |           | NIG    |           |           | 5/2    |           |               | SZ.                  |           | 70.00          |           |          |
| 2,4-D                      |       | S          |       |       | CZ.        | +         | +         | GN,    |           | Ī         |        |           |               | NIG.                 |           |                |           |          |
| xCDD                       |       | SS         |       |       | NS         | +         | 1         | N.     | 1         |           | CZ,    | T         |               | 2 2                  |           | Ī              |           |          |
| HxCDF                      |       | SS         |       |       | NS         | 1         |           | SZ     | T         | 1         | S      | 1         |               | CZ.                  |           |                |           |          |
|                            |       |            |       |       |            |           | +         |        | 1         | 1         |        |           |               | 2120.010             |           |                | W         | 1        |
| Heavy Metals               | ı/dn  | ND/NS      |       | ng/J  | ND/NS      |           | /ân       | SN/QN  | 1         | l/gu      | ND/NS  |           | ng/i          | SNION                |           |                | ngn       | An       |
| Antimony                   |       | NS         |       |       | NS         | 1         |           | SZ     |           | 1         | SS     | 1         | 000           | SS                   |           | 00.00          |           |          |
| Arsenic                    |       | ΩN         | 4.00  | 20.00 |            |           |           | QN     | 2.00      | 2.00      |        |           | 2.00          |                      |           | 20.00          |           |          |
| Bariun                     |       | SN         |       |       | -          |           |           | NS     |           | 00:001    |        |           | 160.00        |                      |           | 2000.00        |           |          |
| adminm                     | 01.0  |            |       |       |            | 0.10      | 0.20      |        |           | 0.10      |        |           |               | ΩN                   | 0.40      | 5.00           |           |          |
| Chromin                    |       | S          | 10.00 |       | H          | 10.00     |           | ND     | 10.00     |           | Q      | 1.00      |               | ND                   | 4.00      | 100.00         |           |          |
|                            |       | 2          | 10.00 |       | ╀          | 10.00     | 10.00     | ┝      |           |           | QN     | 10.00     |               | QN                   | 10.00     | 1000.00        |           |          |
| Compet                     |       | 2          | 20.0  |       | ╀          | 100       |           | Ę      | 00 1      |           | CZ     | 0.20      |               | QN                   | 0.20      | 15.00          |           |          |
| Lead                       |       |            | 3     |       | ╀          | 02.0      | t         | Ę.     | 0.00      | l         | Ę      | 0.00      | 0.30          |                      |           | 2.00           |           | L        |
| Mercury                    |       | 2          | 0.40  |       | +          | 0.20      |           | 2 2    | 2         |           | DIA.   |           |               | NIC                  |           | 100 00         |           |          |
| Nickel                     |       | SS         |       |       | N.         |           | 1         | No.    |           |           | SNI S  |           |               | O N                  |           | 20.00          |           |          |
| Selenium                   |       | SZ         |       |       | NS         |           |           | SS     | 1         |           | Z      |           |               | Z :                  |           | 30.00          | 00 001    |          |
| Silver                     |       | NS         |       |       | SN         |           | 1         | NS     |           |           | SZ     |           |               | 2                    |           |                | 100.00    |          |
| allium                     |       | NS         |       |       | NS         |           | 1         | NS     |           |           | NS     |           |               | SZ                   |           | 2.00           |           | 1        |
| Vanadinin                  |       | NS         |       |       | -          |           |           | +      |           |           | NS     |           |               | ž                    |           |                |           | 45.00    |
| Zinc                       | 10.00 |            |       |       | ND         | 10.00     |           | Ð      | 10.00     | 10.00     |        |           | 30.00         |                      |           |                | 2000.00   |          |
|                            |       |            |       |       |            |           |           |        |           |           |        |           |               |                      |           |                |           |          |
| Commendianal Parametery    | l/am  | SN/QN      |       | l∕am  | SN/QN      |           | l/gm      | ND/NS  |           | mg/l      | ND/NS  |           | mg/l          | ND/NS                |           | mg/l           | l/gm      | /Su      |

|      | T                                       | T  | 7     | 7      |  | 00.0  |         |    | 5                    |                      |                     | 7      | 7        |  |  |  | 1  | 7  |            |  | Ţ   |         |  |   | 1  | 1  | 1   |  |  |  | 7   | ٦  |  | 1  |   | 8   |  |
|------|---|--|-------|--------|--|-------|---------|----|----------------------|----------------------|---------------------|--------|----------|--|--|--|--|--|------------|--|---|---------|--|---|--|--|---|--|--|--|---|--|--|--|---|---|--|
| -    | +                                       | +  | -     |        | -  | Ц     | 0       | H  | $\dashv$             | -                    | +                   |        | $\dashv$ | +  | +  | +  | +  | +  | +          | 2  | +   | +       | +  |   |  | +  | +   | +  | +  | +  | $\downarrow$  | $\dashv$   | $\downarrow$   | $\frac{1}{1}$  | +   | o   | $\dashv$   |
|      |   |  |       | 100.00 |  |       | \$000.0 |    | mg/l                 |                      |                     | 250.00 |          |  |  |  |  | 0.30   |            | 6.5-8.   |   |         |  | 200.00  | 250.00                                       |  |   |  |  | 0.03   |   |  |  |  |   |   |  |
| 2.00 | 200                                     | 100.00                                   | 20.00 |        | 2.00   |       |         |    | l/gm                 |                      |                     |        | 0.20     |  |  | 10.00  | 1.00   |  |            |  |   |         |  |   |  |  |   |  |  |  |   | 160.00   |  |  |   |   |  |
|      |   |  |       |        |  |       |         |    |                      |                      |                     |        |          | 20.00  |  |  | 0.00   |  |            |  |   |         |  |   |  |  |   |  |  |  |   |  |  |  |   |   |  |
|      | 95.5                                    | SZ                                       | NS    | NS     | NS   | SN    |         |    | ND/NS                | SN                   |                     |        | NS       | Q  | NS   |  | Q  |  | SS         | NS   | NS  | SS      |  |   |  | NS   | SN  | SS   |  |  |   |  |  |  | SS  | NS  | NS   |
| 0.30 | 0.30                                    |  |       |        |  |       | 30.00   |    | l/gm                 |                      | 220.00              | 100.00 |          |  |  | 0.91   |  | 14.00  |            |  |   |         | 51.00  | 2500.00   | 910.00                                       |  |   |  | 160.00   | 3.90   | 15.00   | 95.00  | 790.00   | 340.00   |   |   |  |
| 0.00 | 0.20                                    |  |       |        |  |       |         |    |                      |                      |                     |        |          |  |  |  | 0.00   |  |            |  |   |         |  |   |  |  |   |  |  |  |   |  |  |  |   |   |  |
| 5    | 2                                       | NS                                       | NS    | NS     | NS   | NS    |         |    | ND/NS                | NS                   |                     |        | NS       |  | NS   |  | QN   |  | NS         | NS   | NS  | NS      |  |   |  | NS   | NS  | NS   |  |  |   |  |  |  | SN  | NS  | NS   |
|      |   |  |       |        |  |       | 10.00   |    | l/gm                 |                      | 110.00              | 100.00 |          | 0.99   |  | 0.28   |  | 9.50   |            |  |   |         | 23.00  | 2000.00   | 730.00                                       |  |   |  | 130.00   | 3.10   | 14.00   | 100.00   | 870.00   | 280.00   |   |   |  |
| 0.00 | 0.20                                    |  |       |        |  |       | 10.00   |    |                      |                      |                     |        |          |  |  | 0.25   | 0.25   |  |            |  |   |         |  |   |  |  |   |  |  |  |   |  |  |  |   |   |  |
| CIV  | 2                                       | NS                                       | NS    | SN     | NS   | SZ    | QN      |    | ND/NS                | SN                   | SN                  |        | NS       |  | NS   | ND   | ND   |  | NS         | NS   | NS  | NS      |  |   |  | NS   | NS  | NS   |  |  |   |  |  |  | NS  | NS  | NS   |
|      |   |  |       |        |  |       |         |    | Иш                   |                      |                     | 460.00 |          | 0.82   |  |  |  | 0.22   |            |  |   |         | 65.00  | 4600.00   | 1700.00                                      |  |   |  | 280.00   | 12.00  | 13.00   | 230.00   | 770.00   | 520.00   |   |   |  |
| 00.0 | 0.20                                    |  |       |        |  |       | 10.00   |    |                      |                      |                     |        |          |  |  | 0.50   | 0.50   |  |            |  |   |         |  |   |  |  |   |  |  |  |   |  |  |  |   |   |  |
| CIN  | O.                                      | NS                                       | SN    | SN     | NS   | SN    | S       |    | ND/NS                | SN                   | SN                  |        | SN       |  | SN   | ND   | ND   |  | NS         | NS   | NS  | NS      |  |   |  | NS   | NS  | NS   |  |  |   |  |  |  | NS  | NS  | NS   |
|      |   |  |       |        |  |       |         |    | l/gm                 |                      |                     | 300.00 |          | 1.20   |  |  |  | 1.30   |            |  |   |         | 21.00  | 5740.00   | 1600.00                                      |  |   |  | 460.00   | 9.80   | 55.00   | 370.00   | 1450.00  | 00.009   |   |   |  |
| 9    | 0.40                                    |  |       |        |  |       |         |    |                      |                      |                     |        |          |  |  |  | 0.10   |  |            |  |   |         | 4.00   |   |  |  |   |  |  |  |   |  |  |  |   |   |  |
| 2    | Q                                       | NS                                       | SN    | SN     | SZ   | SZ    |         |    | ND/NS                | SN                   | NS                  |        | SN       |  | SN   |  | QN   |  | NS         | NS   | NS  | SN      | ND   |   |  | NS   | NS  | NS   |  |  |   |  |  |  | NS  | SN  | NS   |
|      |   |  |       |        |  |       | 10.00   |    | 1/Sui                |                      |                     | 160.00 |          | 99:0   |  | 3.50   |  | 0.02   |            |  |   |         |  | 1700.00   | 00.069                                       |  |   |  | 00.06  | 80.0   | 5.20  | 31.00  | 410.00   | 310.00   |   |   |  |
|      | cury                                    | 9  | nium  | ī      | lium   | adinn |         |    | ventional Parameters | ogical Oxygen Demand | nical Oxygen Demand | rides  | uide     | noma, Nitrogen                               | unic Nitrogen  | ate  | ite  |  | und Grease |  | Tols (Total)  | sphorus | d Suspended Solids                           | d Dissolved Solids  | ite  | I Organic Carbon   | (Duplicate)   | d Organic Halogens   | nesiun   | genese   | muiss.  | un   | dinity   | umi  | dness   | nc  | Specific Conductance (umho/cm)   |
|      | 110 100 110 110 110 110 110 110 110 110 | ury ND 0.40 ND 0.20 ND 0.20 ND 0.20 0.30 | NS    | NS     | ry         ND         0.20         ND         0.20         ND         0.20         ND         0.30         NB         NB | No    | 1       | Na | Na                   | 1                    | 1                   | 1      | 1        | Type (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | time         NS         N | Type (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | Main State   Mai | The color of the | 1          | Type         NS         N | Type (1) (1) (2) (1) (2) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4 | 1       | Type (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | Type (Type)         NS         NS | Type (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | Type (Type)         Type (Type)         NS         NS <td>  No.   No.</td> <td>Type of the color of</td> <td>type         1 bit         1 bit</td> <td>type         NY         0.20         NY         0.20         NY         0.20         NY         0.20         NY         0.20         NY         0.20         NY         NY</td> <td>Type of the problem of the p</td> <td>Opportment         Opportment         NS         NS</td> <td>Opportment         NS         NS</td> <td>Opportment         NS         NS</td> <td>Type state of the color of the col</td> <td>Type state of the color of the col</td> <td>Type of the color of</td> | No.   No. | Type of the color of | type         1 bit         1 bit | type         NY         0.20         NY         0.20         NY         0.20         NY         0.20         NY         0.20         NY         0.20         NY         NY | Type of the problem of the p | Opportment         Opportment         NS         NS | Opportment         NS         NS | Opportment         NS         NS | Type state of the color of the col | Type state of the color of the col | Type of the color of |

NB - Not Sampled
ND - Not Detected
Det Limin: Sampling Detection Limit
MCL - Maximum Contaminum Level; Enforceable Groundware Standards
SMCL- Secondary Maximum Contaminum Level; Enforceable Groundware Standards
Finithere Concentrations - Not Enforceable Groundware Standards
Finithere Concentrations - Not Enforceable Standards

Table A.37: Characteristics of the South Carolina Landfill.

LANDFILL:

South Carolina Landfill.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

South Carolina Department of Health and Environmental Control

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 1.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

Unknown.

YEARS IN SERVICE:

Unknown.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Unknown.

MISCELLANEOUS:

None.

|   | Re    | 1994<br>Result D | Det Limit | Primary<br>MCL | Secondary<br>MCL | Cuidance |
|---|-------|------------------|-----------|----------------|------------------|----------|
| olatiles                                | /an   | D/NS             | Ц         | ng/l           | l/ån             | l∕∂n     |
| Acetone                                 |       | NS               |           |                |                  | 700.00   |
| 2-Butanone                              |       | SN               |           |                |                  | 4200.00  |
| Carbon Disulfide                        |       | SN               |           |                |                  | 700.00   |
| Chloromethane                           |       | SN               |           |                |                  | 2.70     |
| .1-Dichloroethane                       |       | SN               |           |                |                  | 700.00   |
| 1.2-Dichloroethane                      |       | NS               |           | 3.00           |                  |          |
| 4-Dioxane                               |       | SN               |           |                |                  | 5.00     |
| Ethylbenzene                            |       | NS               |           |                | 700.00           |          |
| Mathyl Ethyl Ketone (MFK)               |       | 82               |           | Ī              |                  | 4200 00  |
| Mathyl 2-Dantanone                      |       | SN               |           | T              |                  |          |
| Mathylana Chlorida                      |       | SN               |           | 8              |                  |          |
| denyiere charico                        |       | 014              |           | 90             |                  |          |
| l outene                                |       | CN SIX           |           | 3000           |                  |          |
| I, I, I inclusive mane                  |       | CN.              | 2         | 30.00          |                  |          |
| Inchloroethylene                        |       | SZ               |           | 3.00           |                  |          |
| Trichlorofluoromethane                  |       | NS               |           |                |                  | 2100.00  |
| (ylenes (Total)                         |       | NS               | 10        | 10000.00       |                  |          |
|   |       |                  |           | 1              |                  |          |
| Semi-Volatiles                          | ng/l  | ND/NS            |           | ug/l           | 1/gn             | /an      |
| Acenaphthene                            |       | SN               |           |                |                  | 20.00    |
| Acetophenone                            |       | NS               |           |                |                  | 700.00   |
| Benzene                                 |       | SN               |           | 001            |                  |          |
| Benzoic Acid                            |       | SN               |           |                |                  | 28000 00 |
| Ris(2-Ethvihexvl)nhthalate              |       | or.              |           |                |                  |          |
| A Dimathydeshand                        |       | 200              |           |                |                  | 400 00   |
| St. Data - Lot - Lot                    |       | OI V             |           | T              |                  | 200 00   |
| Di-ii-buiyi piinidaate                  |       | CNI              |           | Ī              |                  | 2000     |
| Diethyl Phthalate                       |       | N                |           | Ī              |                  | 2000.00  |
| Fluoranthene                            |       | NS               | 1         |                | -                | 280.00   |
| Vapthalene                              |       | NS               |           |                |                  | 08.9     |
| m&p-Creosol                             |       | SN               |           |                |                  | 35.00    |
| o-Creosol                               |       | SN               |           |                |                  | 350.00   |
| Phenathrene                             |       | SN               |           |                |                  | 10.00    |
| 1                                       |       | MIG              |           | Ī              |                  | 00 01    |
| Litetro                                 |       | 514              |           | T              |                  | 010      |
| ryiene                                  |       | CNI              |           | T              |                  | 770.00   |
|   |       |                  | +         | Ī              |                  |          |
| Herbicides/Pesticides                   | Ìn    | ND/NS            |           | lan            | ug/l             | lg.      |
| Alpha-BHC                               |       | SS               |           |                |                  | 0.05     |
| Endrin                                  |       | NS               |           | 2.00           |                  |          |
| Dieldrin                                |       | SN               |           |                |                  | 0.10     |
| Dimethoste                              |       | 82               |           |                |                  | 2.00     |
| Amoundate.                              |       | N.O.             |           | Ī              |                  | 0 0      |
| Distriction                             |       | 2                | $\dagger$ | Ī              |                  | 0.50     |
| ,4,5-I                                  |       | SS               |           |                |                  | 70.00    |
| ,4-D                                    |       | NS               | , ,       | 70.00          |                  |          |
| HxCDD                                   |       | NS               |           |                |                  |          |
| H.COP                                   |       | SZ.              |           |                |                  |          |
| INCOL                                   |       | 2                |           | Ī              |                  |          |
|   |       |                  |           | 7              |                  | ,        |
| Heavy Metals                            | ng/J  | NDINS            |           | ng/l           | ug/l             | III      |
| Antimony                                |       | SZ               |           | 00.9           |                  |          |
| Arsenic                                 | 1.40  |                  |           | 20.00          |                  |          |
| Barnim                                  |       | SZ               | 2(        | 2000.00        |                  |          |
| 24                                      | 1 70  |                  |           | 8              |                  |          |
| ארייייייייייייייייייייייייייייייייייייי | 16.00 |                  |           | 00.00          |                  |          |
| Chromwan                                | 00.01 |                  |           | 00.00          |                  |          |
| opper                                   | 9.20  |                  |           | 1000.00        |                  |          |
| ead                                     |       | NS               |           | 15.00          |                  |          |
| Mercury                                 |       | NS               |           | 2.00           |                  |          |
| Nickel                                  |       | SN               | -         | 100.001        |                  |          |
| elenium                                 |       | SN               |           | 50.00          |                  |          |
| Silver                                  |       | SZ               |           |                | 100.00           |          |
| Thollium                                |       | 82               |           | 2 00           |                  |          |
| Vanadiim                                |       | 82               |           |                |                  | 49.00    |
|   | 00 33 |                  |           |                | 000000           |          |
| Zunc .                                  | 02.00 |                  |           | T              | 2000.00          |          |
|   |       |                  |           | ,              |                  |          |
| Conventional Parameters                 | mg/I  | ND/NS            |           | i i            | mg/s             | mg/s     |
| Biological Oxygen Demand                |       | SN               |           |                |                  |          |
|   |       |                  | 8         |                |                  |          |

| Cadmium                        | 1.79    |       |      | 5.00    |         |       |  |
|--------------------------------|---------|-------|------|---------|---------|-------|--|
| Chromiun                       | 16.00   |       |      | 100.00  |         |       |  |
| Copper                         | 9.20    |       |      | 1000.00 |         |       |  |
| Lead                           |         | SN    |      | 15.00   |         |       |  |
| Mercury                        |         | SN    |      | 2.00    |         |       |  |
| Nickel                         |         | NS    |      | 100.00  |         |       |  |
| Selenium                       |         | NS    |      | \$0.00  |         |       |  |
| Silver                         |         | SN    |      |         | 100.00  |       |  |
| Thallium                       |         | SN    |      | 2.00    |         |       |  |
| Vanadiun                       |         | NS    |      |         |         | 49.00 |  |
| Zinc                           | 65.00   |       |      |         | 2000.00 |       |  |
| Conventional Parameters        | l/gm    | ND/NS |      | l/gm    | l/gm    | l/gm  |  |
| Biological Oxygen Demand       |         | SN    |      |         |         |       |  |
| Chemical Oxygen Demand         |         | SN    | 5.00 |         |         |       |  |
| Chlorides                      | 250.00  |       |      |         | 250.00  |       |  |
| Cyanide                        |         | SN    |      | 0.20    |         |       |  |
| Ammonia, Nitrogen              |         | SN    |      |         |         |       |  |
| Organic Nitrogen               |         | SN    |      |         |         |       |  |
| Nitrate                        |         | SN    |      | 10.00   |         |       |  |
| Nitrite                        |         | NS    |      | 1.00    |         |       |  |
| Iron                           | 08'0    |       |      |         | 0.30    |       |  |
| Oil and Grease                 | 15.00   |       |      |         |         |       |  |
| hd                             |         | NS    |      |         | 6.5-8.5 |       |  |
| Phenols (Total)                |         | NS    |      |         |         |       |  |
| Phosphorus                     |         | NS    |      |         |         |       |  |
| Total Suspended Solids         | 110.00  |       |      |         |         |       |  |
| Total Dissolved Solids         | 8400.00 |       |      |         | \$00.00 |       |  |
| Sulfate                        | 250.00  |       |      |         | 250.00  |       |  |
| Total Organic Carbon           |         | NS    |      |         |         |       |  |
| TOC (Duplicate)                |         | NS    |      |         |         |       |  |
| Total Organic Halogens         |         | NS    |      |         |         |       |  |
| Magnesium                      |         | NS    |      |         |         |       |  |
| Mangenese                      | 0.05    |       |      |         | 0.05    |       |  |
| Potassium                      |         | NS    |      |         |         |       |  |
| Sodium                         |         | SN    |      | 160.00  |         |       |  |
| Alkalinity                     |         | SN    |      |         |         |       |  |
| Calcium                        |         | SN    |      |         |         |       |  |
| Hardness                       |         | NS    |      |         |         |       |  |
| Boron                          |         | NS    |      |         |         | 0.63  |  |
| Specific Conductance (unho/cm) |         | NS    |      |         |         |       |  |
|                                |         |       |      |         |         |       |  |

NB - Not Sampled

ND - Not Detected

Dot Limit: Sampling Detection Limit

MCL - Maximum Contaminant Level: Enforceable Groundwater Standards

SMCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards

SMCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards

Outdance Contentrations - Not Enforceable Standards

Table A.39: Characteristics of the South Windsor Site of Connecticut.

LANDFILL:

South Windsor Site, Connecticut.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

Bulky Waste Leachate Characterization Survey

Maurice Hamel, Connecticut Department of Environmental

Protection

Presented in C&D Waste Landfills, Leachate Quality Data,

Volume 2.

Prepared by Gershman, Brickner & Bratton, Inc.

For the National Association of Demolition Contractors.

WASTE TYPE:

Demolition debris and landclearing debris.

ACREAGE:

3 acres.

YEARS IN SERVICE:

Opened between 1969 and 1975.

LINER SYSTEM:

Unknown.

LEACHATE SYSTEM:

Unknown.

LEACHATE SAMPLE:

Leachate sample taken from seep at the base of landfill.

MISCELLANEOUS:

Two samples taken from SW 3 in 1987 by Geotoxi as part of site

closures.

Table A.40: Sampling for the South Windsor Bulky Waste Landfill of Connecticut.

| Polatiles  |   |   | N N N N N N N N N N N N N N N N N N N    | San Table | NS NS NS NS NS NS NS NS NS NS NS NS NS N | Vân    | ND/NS<br>NS<br>NS<br>NS<br>NS<br>NS | l/ån    | Vân       | 100.00<br>700.00<br>700.00<br>2.70<br>700.00 |
|--|---|---|--|-----------|--|--------|-------------------------------------|---------|-----------|--|
| 2  |   |   | N N N N N N N N N N N N N N N N N N N    |           | N N N N N N N N N N N N N N N N N N N    |        | SN SN S                             | •       |           | 700<br>4200.00<br>700.00<br>2.70<br>700.00   |
|  |   |   | 2  |           | N N N N N N N N N N N N N N N N N N N    |        | NS NS                               |         |           | 4200.00<br>700.00<br>2.70<br>700.00          |
| l'ân   |   |   |  |           | S S S S S S S S S S S S S S S S S S S    |        | SZ SZ                               | _       |           | 2.70<br>700.00                               |
| l'ân   |   |   | 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8  |           | NS NS NS NS NS NS NS NS NS NS NS NS NS N |        | 21/4                                |         |           | 2.70   |
| l'àn   |   | <del>                                      </del> |  |           | NS NS NS NS NS NS NS NS NS NS NS NS NS N |        |                                     |         |           | 700.00                                       |
| Lg u   |   |   | 2 8 8 8 8 8 8 8 8 8 8 8                  |           | SN NS                                    |        | SN SN                               |         |           |  |
| l'ân   |   | <del>                                      </del> | 2 8 8 8 8 8 8 8 8 8 8 8 8                |           | NS NS                                    |        | 82                                  | 3.00    |           |  |
| l'ân   |   |   | <u> </u>                                 |           | S N N                                    |        | SZ                                  |         |           | \$ 00  |
| l'ân   |   | <del>┞┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋┋</del>  | 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8    |           | NIG                                      |        | SN                                  |         | 700.00    |  |
| l'ân   |   |   | N N N N N N N N N N N N N N N N N N N    |           | IN ON                                    |        | NS                                  |         |           | 4200.00                                      |
| l'àn l'àn  |   |   | NS NS NS NS NS NS NS NS NS NS NS NS NS N |           | NS                                       |        | NS                                  |         |           |  |
| l'àn oi  |   | <del>                                     </del>  | N N N N N N N N N N N N N N N N N N N    |           | SN                                       |        | NS                                  | \$.00   |           |  |
| l/ân oj  |   | <del>                                     </del>  | 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8    |           | SN                                       |        | SN                                  | 1000 00 |           |  |
| l/ân<br>n  |   |   | SN NS<br>NS NS                           |           | SN                                       |        | SZ.                                 | 200 00  |           |  |
| l'ân oi  |   | <del>                                      </del> | NS NS                                    |           | SN                                       | -      | SN                                  | 3.00    |           |  |
| l'ân<br>o  |   |   | NS NS                                    |           | ON                                       |        | SIN                                 | 20.5    |           | 2100.00                                      |
| hthene hthene hthene herone e e e e e e e e e e e e e e e e e e  |   |   | IND                                      |           | ON DIV                                   |        | S N                                 | 1000000 |           | 20.00.14                                     |
| hthene benche continued by the continued |   |   |  | -         | S.V.                                     |        | er.                                 | 0.0001  |           |  |
| hthere e c tylide tylid |   | <del>                                     </del>  | ND/NS                                    | l/an      | ND/NS                                    | 1/3n   | ND/NS                               | Ngu     | l/an      | l/dn   |
| learone  e for Acid In Microsolphinalate In Phithalate The the fine thene seasol tol urene SHC SHC SHC   |   |   | SN                                       |           | SN                                       |        | NS                                  |         |           | 20.00  |
| e c. Acid  thylhexylphinalate  thylphenol  thylphenol  thylphinalate  Phitialate thene  trosol  urene  arene  select  thene  select  thene  select  thene  select  thene  select  thene  select  selec |   |   | SN                                       | L         | NS                                       |        | NS                                  |         |           | 700.00                                       |
| : Acid thyllexy()phthalate thylphenol try( phthalate thene t |   |   | NS                                       |           | NS                                       |        | SN                                  | 1.00    |           |  |
| thylhexyl)phthalate rethylphenol Intylphenol Intylphenol Intralate Interesting |   |   | NS                                       |           | NS                                       |        | NS                                  |         |           | 28000.00                                     |
| rethylphenol hylphthalate Phithalate Phithalate thene record tol urene arene arene sene sene sene sene sene sene sene  |   |   | SN                                       |           | SN                                       |        | NS                                  |         |           |  |
| Tryl phthialate Phthialate there there record tol urene atea/Perticides ug/f   |   |   | NS                                       |           | NS                                       |        | NS                                  |         |           | 400.00                                       |
| Phitalate thene tene terosol tol urene area/Pericides ugfl   |   |   | NS                                       |           | NS                                       |        | NS                                  |         |           | 700.00                                       |
| thene tene tene tene terosol tene tene tene tene total des tene tene tene tene tene tene tene te   |   |   | NS                                       |           | NS                                       |        | NS                                  |         |           | \$600.00                                     |
| record  Indi  ndi  |   | -   | NS                                       |           | NS                                       |        | NS                                  |         |           | 280.00                                       |
| recool  urene  dewPesticides ugf   |   |   | NS                                       |           | NS                                       |        | NS                                  |         |           | 6.80   |
| uene dev/Perticides ug/l 3HC   | 1 |   | NS                                       |           | NS                                       |        | NS                                  |         |           | 35.00  |
| wene devPerticides ug/l  |   |   | NS                                       |           | NS                                       |        | SN                                  |         |           | 350.00                                       |
| devPerticides ug/l   |   | 1   | SN                                       |           | SN                                       | +      | SZ.                                 |         |           | 10.00  |
| ides/Peritoides ug/l   |   |   | SN                                       |           | NS NS                                    |        | No.                                 |         |           | 2000   |
| ides/Pesticides ug/l<br>BHC  |   | $\dagger$   | NA.                                      | -         | CN                                       |        | 2                                   |         |           | 710.00                                       |
| BHC  |   | +   | NDAN                                     | 1/011     | ND/NS                                    | (/on   | NDANS                               | Van     | 1/611     | l/dn   |
|  |   |   | SN                                       | 4         | SN                                       |        | SN                                  |         |           | 0.05   |
|  |   |   | SN                                       |           | 22                                       |        | SX                                  | 2.00    |           |  |
|  |   |   | SN                                       | -         | SZ                                       |        | SN                                  |         |           | 0.10   |
| Directionste   |   | l   | SZ                                       |           | NS                                       |        | NS                                  |         |           | 5.00   |
|  |   | T   | NS                                       |           | NS.                                      |        | NS                                  |         |           | 0.50   |
|  |   | l   | NS                                       |           | NS                                       |        | NS                                  |         |           | 70.00  |
|  |   |   | NS                                       |           | SN                                       |        | NS                                  | 70.00   |           |  |
| 0  |   |   | NS                                       |           | NS                                       |        | NS                                  |         |           |  |
|  |   |   | NS                                       |           | NS                                       |        | NS                                  |         |           |  |
|  |   |   |  |           |  |        |                                     |         |           |  |
| Heavy Metals ND/NS   |   | l/dn  | ND/NS                                    | l/an      | ND/NS                                    | (ån    | ND/NS                               | /Sn     | /ån       | /an  |
| ıy   |   | 1   | SN                                       | 1         | SZ OZ                                    | +      | S CX                                | 00.00   |           |  |
| 400.00   |   | 000 000   | ND.                                      |           | SN                                       | 200 00 | 2                                   | 2000 00 |           |  |
| Codmittee 20.00  |   | 700.00  | CZ                                       |           | SN                                       | 10.00  |                                     | 5.00    |           |  |
|  |   |   | GN                                       |           | SN                                       | 10.00  |                                     | 100.00  |           |  |
| 00 09  |   | 20.00   |  |           | QX                                       | 40.00  |                                     | 1000.00 |           |  |
| .ead 80.00   |   | 70.00   |  |           | QX.                                      | 90.00  |                                     | 15.00   |           |  |
| ury  |   |   | ND                                       |           | NS                                       |        | QN                                  | 2.00    |           |  |
|  |   |   | NS                                       |           | NS                                       |        | NS                                  | 100.00  |           |  |
|  |   |   | ND                                       |           | NS                                       |        | QN                                  | 20.00   |           |  |
|  |   | 1   | NO<br>NO                                 |           | SZ                                       |        | QN                                  |         | 100.00    |  |
| hallium  |   | 1   | NS S                                     |           | NS OF                                    |        | S SZ                                | 2.00    |           | 40.00  |
| umpi   |   |   | 202                                      |           | No.                                      | +      | SN SN                               |         | \$000,000 | 43.00  |
| CALIC  |   |   | 2  | -         | CAL                                      |        |                                     |         | 2000      |  |
| Commentional Desamoders mail ND/NS   |   | l/em  | SN/GN                                    | l/out     | ND/NS                                    | Vem.   | ND/NS                               | I/sm    | l/am      | l/am   |

|   |          |        |         |       |   |        | 200   | -    |         | NO    |      | 20.00   |         |       |
|---|----------|--------|---------|-------|---|--------|-------|------|---------|-------|------|---------|---------|-------|
| Barium                                    | 400.00   |        | 200.00  |       |   |        | NS    |      | 200.00  |       |      | 2000.00 |         |       |
| Cadmitt                                   | 20.00    |        |         | ΩN    |   |        | NS    |      | 10.00   |       |      | 5.00    |         |       |
| Chromium                                  |          | QZ     |         | ΩN    |   |        | NS    |      | 10.00   |       |      | 100.00  |         |       |
| Copper                                    | 90.09    |        | 20.00   |       |   |        | ΩN    |      | 40.00   |       |      | 1000.00 |         |       |
| Lead                                      | 80.00    |        | 70.00   |       |   |        | ΩN    |      | 90.00   |       |      | 15.00   |         |       |
| Marcino                                   |          | CZ     |         | QN    |   |        | SN    |      |         | QN    |      | 2.00    |         |       |
| Misleal                                   |          | SZ.    |         | SN    |   |        | SN    |      |         | SN    |      | 100.00  |         |       |
| Nickel                                    |          | 2      |         | S     |   |        | NS    |      |         | £     |      | \$0.00  |         |       |
| Scienain                                  |          | 2 2    |         | 5     |   |        | 22    |      |         | QZ    |      |         | 100.00  |       |
| Suver                                     |          |        |         | 914   |   |        | SZ.   |      |         | SZ    |      | 2.00    |         |       |
| Thallium                                  |          | SZ.    |         | SN.   |   |        | NIG   |      |         | SZ.   |      |         |         | 49.00 |
| Vanadium                                  |          | SN     |         | ZZ,   | 1 |        | CZ SZ |      |         | DIA   |      |         | 5000 00 |       |
| Zinc                                      |          | SZ     |         | Z.    |   | T      | 2     |      |         |       |      |         |         |       |
| D. C. | 1/2000   | SN/GN  | Vous    | SN/GN |   | l/am   | ND/NS |      | l/am    | ND/NS |      | √am     | Sm      | mg/l  |
| District Convention                       | 21 00 10 | CANADA | 10.00   |       | Ī |        | Q     | 1.00 |         | Q.    | 1.00 |         |         |       |
| Biological Oxygen Delinand                | 11000    |        | 35.00   |       |   | 20.00  |       |      | 40.00   |       |      |         |         |       |
| Calculate Caygon Commun                   | 33.00    |        | 30.00   |       |   |        | SN    |      | 37.00   |       |      |         | 250.00  |       |
| Citionides                                | 20.00    | 21/2   |         | CZ    |   | 0 0    |       |      | 0.02    |       |      | 0.20    |         |       |
| Cyande                                    | 07.0     | 2      | 1 10    |       |   | 080    |       |      | 0.44    |       |      |         |         |       |
| Anthonia, Nincogen                        | 0.40     |        | 0.00    |       |   | 0.00   |       |      | 0.32    |       |      |         |         |       |
| Organic Nitrogen                          | 1.30     | 4      | 000     |       |   |        | 82    |      | 0.10    |       |      | 10.00   |         |       |
| Nifrate                                   |          | Q.     | 0.0     |       | T | 100    |       |      | 0.01    |       |      | 1 00    |         |       |
| Nighte                                    | 0.0      |        | 0.01    |       |   | 10.0   | Mo    | T    | 17.00   |       |      |         | 0.30    |       |
| Iron                                      | 13.00    |        | 34.00   |       |   | 1      | 2 5   |      | 3.1     | 014   |      |         |         |       |
| Oil and Grease                            |          | NS     |         | SS    |   |        | SZ.   | 1    | 3,      | 2 P   |      |         | 3033    |       |
| Hd  | 6.80     |        | 6.70    |       |   | 6.70   | 1     |      | 0.30    | 5     | 1    |         | 0.2-6.3 |       |
| Phenols (Total)                           |          | SN     |         | SN    |   |        | SS    | 1    |         | 2     |      |         |         |       |
| Phosphorus                                |          | NS     |         | NS    |   | 1      | SS    |      |         | SS    |      |         |         |       |
| Total Suspended Solids                    | 260.00   |        | 9.60    |       |   | 140.00 | 1     |      | 18.00   |       |      | 1       |         |       |
| Total Dissolved Solids                    | 440.00   | SN     | \$80.00 | NS    |   | 530.00 | SN    |      | \$10.00 | SN    |      |         | 200.00  |       |
| Sulfate                                   | 26.00    |        | \$5.00  |       |   | 140.00 |       |      | 75.00   |       |      |         | 250.00  |       |
| Total Organic Carbon                      |          | NS     |         | NS    |   |        | SZ    |      |         | SZ    |      |         |         |       |
| TOC (Duplicate)                           |          | NS     |         | NS    |   |        | SZ    |      |         | SZ    |      |         |         |       |
| Total Organic Halogens                    |          | NS     |         | NS    | 1 |        | SN    |      |         | SS    |      | 1       |         |       |
| Magnesium                                 |          | NS     |         | NS    |   |        | SZ    | 1    |         | SN    |      |         |         |       |
| Mangenese                                 | 3.40     |        | 9.60    |       |   |        | SN    |      | 3.40    |       |      |         | 0.02    |       |
| Potassium                                 |          | NS     |         | NS    |   |        | SN    |      |         | SZ    |      |         |         |       |
| Sodium                                    | 20.00    |        | 28.00   |       |   | 31.00  |       |      | 33.00   |       |      | 160.00  |         |       |
| Alkalinity                                | 320.00   |        | 240.00  |       |   |        | SN    |      | 260.00  |       |      |         |         |       |
| Calcium                                   |          | NS     |         | NS    |   |        | SZ    |      |         | SS    |      | 1       |         |       |
| Hardness                                  | 320.00   |        | 720.00  |       |   |        | SN    |      | 250.00  |       |      |         |         |       |
| Boron                                     |          | SS     |         | NS    |   |        | SS    |      |         | SZ    |      |         |         | 0.03  |
| Cracifo Conductonos (umbolom)             | 00000    |        | 00000   |       |   | 5000   |       |      | 200     |       |      |         |         |       |

NS - Not Serroted

ND - Not Detected

Det Limit: Serroteing Detection Limit

MCL - Maximum Conteminent Level; Enforceable Groundwater Standards

SMCL - Secondary Maximum Conteminent Level; Enforceable Groundwater Standards

Guidance Concents attour - Not Enforceable Standards

Table A.41: Characteristics of the Wisconsin Site.

LANDFILL:

Wisconsin Site.

OWNER/OPERATOR:

Unknown.

LITERATURE SOURCE:

Construction and Demolition Landfill Leachate Characterization

Study

Prepared by Rust Environments & Infrastructure for

WMX Technologies, Inc.

WASTE TYPE:

Demolition debris and landclearing debris. Includes brick, concrete,

wood, metals, and roofing shingles.

ACREAGE:

Unknown. However, capacity is estimated at 50,000 cubic yards.

YEARS IN SERVICE:

Began operations in August 1991.

LINER SYSTEM:

Ten foot thick clay liner with a two foot thick drainage layer.

LEACHATE SYSTEM:

Yes.

LEACHATE SAMPLE:

Taken at the low point of the fill area where leachate collected and

was visible.

MISCELLANEOUS:

None.

|   | Result |        | Det Limit | MCL      | 1        |          |
|---|--------|--------|-----------|----------|----------|----------|
| Volatiles                               | l/an   | SN/QN  |           | l/an     | l/da     | l'ân     |
| Butanone                                |        | 2      | 10.00     |          |          | 700.00   |
| Carbon Disulfide                        |        | QN     | 2.00      |          |          | 0.00/    |
| Chloromethane                           |        | QN     | 10.00     |          |          | 20000    |
| 1-Dichloroethane                        |        | QN     | 2.00      | 1        |          | 200.00   |
| 2-Dichloroethane                        |        | ND     | 2.00      | 3.00     |          | 00.4     |
| 4-Dioyane                               |        | Q      | 20.00     |          |          | 2.00     |
| - Dryang                                |        | ND     | 5.00      |          | 700.00   |          |
| Ediylochizene                           | -      | QN     | 10.00     |          |          | 4200.00  |
| lemyl Euryl Netwire (1915A)             |        | CN     | 10.00     |          |          |          |
| 4-Methyl-2-Pentanonie                   |        | GN     | \$ 00     | 5.00     |          |          |
| Methylene Chlonde                       |        | CZ.    | 8         | 1000.00  |          |          |
| Toluene                                 | 1      | 91/2   |           | 200 00   |          |          |
| 1, 1, 1 Trichloroethane                 | 1      | 2 4    | 90        | 3.00     |          |          |
| Trichloroethylene                       |        | ON.    | 00.00     | 27.00    |          | 2100 00  |
| Trichlorofluoromethane                  |        | QN     | 10.00     |          |          | 7100.00  |
| Kylenes (Total)                         |        | ΩN     | 2.00      | 10000.00 |          |          |
|   |        |        |           |          |          |          |
| Semi-Volatiles                          | l/Sn   | ND/NS  |           | 'Man     | ng/l     | l@n      |
| Accomplished                            |        | QN     | 10.00     |          |          | 20.00    |
|   |        | QN     | 10.00     |          |          | 700.00   |
| acetophogram                            |        | QN     | 5.00      | 1.00     |          |          |
| Benzene                                 | 17     |        | 50.00     |          |          | 28000.00 |
| Benzoic Acid                            |        |        | 10.00     |          |          |          |
| Bis(2-Ethylhexyl)phthalate              | 31     | 0.7    | 10.00     |          |          | 400.00   |
| 2,4-Dimethylphenol                      |        | 2      | 000       |          |          | 700.00   |
| Di-n-Butyl phthalate                    | 7      |        | 10.00     |          |          | 00 0098  |
| Diethyl Phthalate                       |        | QN     | 10.00     |          |          | 00 082   |
| Fluoranthene                            |        | ΩN     | 10.00     |          |          | 00.007   |
| Nanthalene                              |        | QN     | 10.00     |          |          | 0.00     |
| Appulation .                            |        | QN     | 10.00     |          |          | 35.00    |
| inæp-Creosoi                            |        | CN     | 10.00     |          |          | 350.00   |
| o-Creosol                               |        | CZ     | 10 00     |          |          | 10.00    |
| Phenathrene                             |        | 2      | 10.00     |          |          | 10.00    |
| Phenol                                  |        |        | 10.01     |          |          | 210.00   |
| Pyrene                                  |        | ON.    | 10.00     |          |          |          |
|   |        |        |           | 1        | 1/000    | l'en     |
| Herbicides/Pesticides                   | ug/l   | SN/QN  |           | iân      | A        | 30.0     |
| Alpha-BHC                               |        | N<br>N | 0.040     |          |          | 0.00     |
| Fodrin                                  |        | QN     | 0.94      | 2.00     | 0        | 1        |
| Dialdrin                                |        | QN     | 0.080     |          |          | 0.10     |
| Dieluin                                 |        | ΩN     | 2.30      |          |          | 5.00     |
| Dimethoate                              |        | Ş      | 1 70      |          |          | 0.50     |
| Disulfoton                              |        | 2      | 0.44      |          |          | 70.00    |
| 2,4,5-T                                 |        | Q.     | -         | 10.00    | 9        |          |
| 2.4-D                                   | 2.2    |        | 0.44      | 1        | 2        |          |
| HyCDD                                   |        | QN     | 1.40      |          |          |          |
| HYONE                                   |        | QN     | 0.70      |          |          |          |
| HACDE                                   |        |        |           |          |          |          |
| - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 | 1/911  | ND/NS  |           | l/din    | l/an     | l/dn     |
| Heavy Metass                            | A      | CN     | 100.00    | L        | 00       |          |
| Antunony                                | 1      |        | 2 00      |          | 00       |          |
| Arsenic                                 | 1      |        | \$0.00    | ۲        | 00       |          |
| Barium                                  | 2      |        | 10.00     | L        | 12       |          |
| Cadmium                                 |        | Z.     | 10.0      | 1        | 2 2      | -        |
| Chromium                                |        | QN     | 20.00     | ľ        | 200      |          |
| Conner                                  |        | QN     | 20.00     | 욉        | 3        |          |
| f and                                   |        | ON     | \$0.00    |          | 00       |          |
| Mercilly                                |        | ON     | 20.00     | -        | 2.00     |          |
| Nickel                                  |        | QN     | 20.00     | -        | 00       |          |
| I WORK                                  |        | QN     | 20.00     | 0 20.00  |          |          |
| Selenum                                 |        | 27     |           |          | 100.00   | 00       |
| Silver                                  |        | 2      | 00.05     | L        | 2 00     | L        |
| Thallium                                |        | Z.     | 10.00     | L        |          | 49.00    |
| Vanadium                                | 1      |        |           |          | 5000 000 | L        |
| Zinc                                    | 400    |        | 10.00     |          |          |          |
|   | _      |        |           |          |          |          |
|   |        |        |           | 1        | Com.     | l/om     |

| HxCDF                          |               | a.    |        |         |         |       |   |
|--------------------------------|---------------|-------|--------|---------|---------|-------|---|
|                                |               |       |        | Varia   | Von     | 1/00  |   |
| Heavy Metals                   | l/8n          | NUNS  | 00.00  | 00 7    |         |       |   |
| Antimony                       |               | QN    | 100.00 | 0.00    |         |       |   |
| America                        | 7             |       | 2.00   | 20.00   |         |       |   |
| Alseine                        | 92            |       | 50.00  | 2000.00 |         |       |   |
| Karnum                         |               | QN    | 10.00  | 5.00    |         |       |   |
| Cadmum                         |               | QN    | 20.00  | 100.00  |         |       |   |
| Chromium                       |               | Q     | 20.00  | 1000.00 |         |       |   |
| Copper                         |               | CZ    | \$0.00 | 15.00   |         |       |   |
| Lead                           |               | Ç     | 20.00  |         |         |       |   |
| Mercury                        |               | CN    | 20.00  | ĭ       |         |       |   |
| Nickel                         |               | 2     | 0000   | L       |         |       |   |
| Selenium                       |               | Q     | 70.00  |         | 100 00  |       |   |
| Silver                         |               | nZ.   | 000    |         |         |       |   |
| Thallium                       |               | QN    | 20.00  | 7.00    |         | 40.00 |   |
| Vanadium                       |               | QN    | 10.00  |         |         | 43.00 |   |
| Zinc                           | 400           |       | 10.00  |         | 2000.00 |       |   |
|                                |               |       |        | •       |         | V-544 |   |
| Conventional Parameters        | mg/l          | ND/NS |        | mg/I    | mg/i    | , Sm  |   |
| Dislocical Occupan Demand      | 13            |       | 2.00   |         |         |       |   |
| Diokygea Cyygen Demand         | 220           |       | 50.00  |         |         |       |   |
| Chemical Oxygen Deniana        | 05            |       | 5.00   |         | 250.00  |       |   |
| Chlorides                      |               | CZ    | 0.01   | 0.20    |         |       |   |
| Cyanide                        |               |       | 010    |         |         |       |   |
| Ammonia, Nitrogen              | 2.4           |       |        |         |         |       |   |
| Organic Nitrogen               |               | Z     |        | ١       |         |       |   |
| Nitrate                        |               | NS    |        | 10.00   |         |       |   |
| Nitrite                        |               | NS    |        | 1.00    |         |       |   |
| Teor                           | 3.1           |       | 0.03   |         | 0.30    |       |   |
| Cil and Canada                 |               | ΩN    | 00'9   | 0       |         |       |   |
| Oll alita Greate               | 16            | 15    |        |         | 6.5-8.5 |       |   |
| pH<br>T                        | 200           |       | 0.01   | _       |         |       |   |
| Phenois (Total)                | 20.0          |       | 0.05   | 2       |         |       |   |
| Phosphorus                     | 1             |       | \$ 00  |         |         |       |   |
| Total Suspended Solids         | 0 00          |       | 00.01  | 0 0     | \$00.00 |       |   |
| Total Dissolved Solids         | 1400          |       | 25.00  |         | 250.00  |       |   |
| Sulfate                        | 0.30          |       | 00.00  |         |         |       |   |
| Total Organic Carbon           |               | 63    | 70.0   |         |         |       |   |
| TOC (Duplicate)                | 49.6          | 9     | 20.00  | 2 .     |         |       |   |
| Total Organic Halogens         | 0.08          |       | 0.0    |         |         |       | _ |
| Magnesium                      |               | SS    |        | 1       | 1       |       | _ |
| Managere                       | L             | NS    | 20     |         | 0.03    |       | _ |
| Defracion                      | L             | NS    | S      |         |         |       | _ |
| Codime                         |               | SN    | 8      | 160.00  | 00      |       | _ |
| Southun                        | -             | NS    | 8      |         |         |       | _ |
| Alkalinty                      |               | SZ    | 52     |         |         |       | _ |
| Calcuin                        | -             | SZ    | 92     |         |         |       |   |
| Hardness                       | +             | Z     | NS     |         |         | 0.63  | - |
| Boron                          | +             | 2     | NA     | -       | -       | L     | _ |
| Specific Conductance (unnovem) | $\frac{1}{4}$ |       |        |         |         |       |   |

NS - Not Sampled
ND - Not Detected
Det Linit - Sampling Detection Limit
Det Linit - Sampling Detection Limit
MCL - Maximum Contaminant Level; Enforceable Groundwater Standards
SMCL - Secondary Maximum Contaminant Level; Enforceable Groundwater Standards
Guidance Concentrations - Not Enforceable Standards

## APPENDIX B:

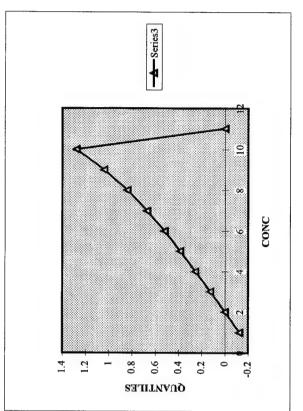
TEST METHODS &
METHOD DETECTION LIMITS

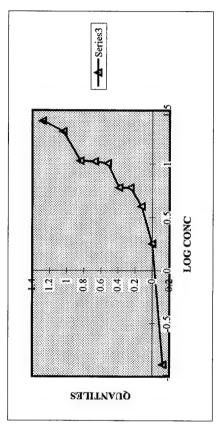
Table B.1: Summary of Test Methods and Method Detection Limits

| Table D. I. Sullillaly of | Table D.1. Suillinally of 1 est precious and precious Eccentum Entires |                 |            |
|---------------------------|--|-----------------|------------|
| PARAMETER                 | TEST METHOD  | DETECTION LIMIT | SOURCE     |
| Copper                    | 6010: Inductive Coupled Plasma Atomic Emission Spectroscopy            | l/gn 9/         | EPA SW-846 |
| Nickel                    | 6010: Inductive Coupled Plasma Atomic Emission Spectroscopy            | 15 ug/l         | EPA SW-846 |
| Cadmium                   | 6010: Inductive Coupled Plasma Atomic Emission Spectroscopy            | 4 ug/l          | EPA SW-846 |
| Chromium                  | 6010. Inductive Coupled Plasma Atomic Emission Spectroscopy            | 7 ug/l          | EPA SW-846 |
| Silver                    | 6010. Inductive Coupled Plasma Atomic Emission Spectroscopy            | 7 ug/l          | EPA SW-846 |
| Vanadium                  | 6010: Inductive Coupled Plasma Atomic Emission Spectroscopy            | 8 ug/l          | EPA SW-846 |
| Thallium                  | 6010: Inductive Coupled Plasma Atomic Emission Spectroscopy            | 40 ug/l         | EPA SW-846 |
| Nitrate                   | 300.0: Determination of Inorganic Anions by Ion Chromatography         | 0.42 mg/l       | EPA-600    |
| Nitrite                   | 300.0: Determination of Inorganic Anions by Ion Chromatography         | 0.36 mg/l       | EPA-600    |
| Sulfate                   | 300.0: Determination of Inorganic Anions by Ion Chromatography         | 2.85 mg/l       | EPA-600    |
| Antimony                  | 7041: Antimony (Atomic Absorption, Furnace Method)                     | 3.0 ug/l        | EPA SW-846 |
| Selenium                  | 7741: Selenium (Gaseous Hydride)                                       | 2 ug/l          | EPA SW-846 |
| Arsenic                   | 7060: Arsenic (Atomic Absorption, Furnace Method)                      | 1 ug/l          | EPA SW-846 |
| Lead                      | 7421: Lead (Atomic Absorption, Furnace Method)                         | 1 ug/l          | EPA SW-846 |
| Phenols                   | 8040: Phenols (Gas Chromatography)                                     | 1.4 ug/l        | EPA SW-846 |
| Total Organic Carbon      | 9060: Total Organic Carbon   | 1 mg/l          | EPA SW-846 |
| Cyanide                   | 9010: Total Cyanide (Manual, Colorimetric)                             | 5 ug/l          | EPA SW-846 |
| Oil and Grease            | 9070. Oil and Grease   | 5 mg/l          | EPA SW-846 |
| Biological Oxygen Demand  | 405.1: Biological Oxygen Demand (5 day, 20 degrees C)                  | 2 mg/l          | EPA-600    |
| Chemical Oxygen Demand    | 410.2: Chemical Oxygen Demand (Titrimetric, Low Level)                 | 5 mg/l          | EPA-600    |
| Mercury                   | 245.2: Mercury (Automated Cold Vapor Technique)                        | .2 ug/l         | EPA-600    |
| Ammonia                   | 350.2: Nitrogen, Ammonia (Colorimetric)                                | .05 mg/l        | EPA-600    |
|                           |  |                 |            |

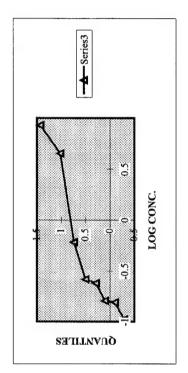
APPENDIX C:

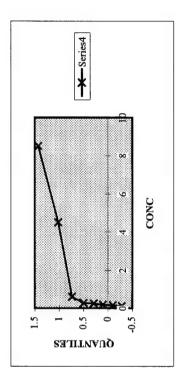
PROBABILITY PLOTS





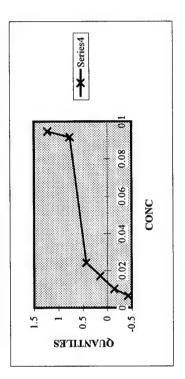
| Cadmium  |          |      |      |              |
|----------|----------|------|------|--------------|
| l/gn     | Log      | Rank | Prob | Quantiles    |
| 0        |          | 1    | 0.05 | -1.645       |
| 0        |          | 2    | 0.1  | -1.28        |
| 0        |          | 3    | 0.15 | -1.04        |
| 0        |          | 4    | 0.2  | -0.84        |
| 0        |          | 5    | 0.25 | <b>19.0-</b> |
| 0        |          | 9    | 0.3  | -0.52        |
| 0        |          | L    | 0.35 | -0.385       |
| 0.       |          | 8    | 0.4  | -0.255       |
| 0.13     | 90988.0- | 6    | 0.45 | -0.125       |
| 1.79     | 0.252853 | 10   | 0.5  | 0            |
| 4        | 0.60206  | 11   | 0.55 | 0.125        |
| 9        | 0.778151 | 12   | 9.0  | 0.255        |
| 9        | 0.778151 | 13   | 0.65 | 0.385        |
| 10.05    | 1.002166 | 14   | 0.7  | 0.52         |
| 10.5     | 1.021189 | 15   | 0.75 | 0.67         |
| 10,66667 | 1.028029 | 16   | 0.8  | 0.84         |
| 20       | 1.30103  | 17   | 0.85 | 1.04         |
| 25       | 1.39794  | 18   | 6.0  | 1.28         |



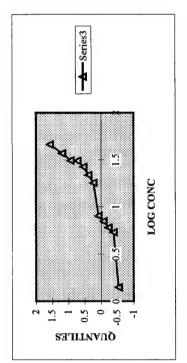


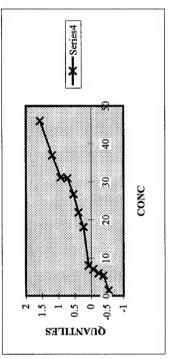
| -0.58414<br>-0.22185<br>0.653213 | -0.79388<br>-0.61979<br>-0.58414<br>-0.22185<br>0.653213 |
|----------------------------------|--|
| 1 12 2                           | 0.653213   |

|     | - Series   |       |          |
|-----|------------|-------|----------|
|     | 4          |       |          |
| ļ - | 0.5        | 0     | 3        |
|     |            | -0.5  |          |
| 4   | <b>⊸</b> d | -1    | NC       |
|     |            | 5     | TOG CONC |
|     | ł          | -1.5  | ĭ        |
|     |            | X 2 X |          |
|     |            | 25    |          |

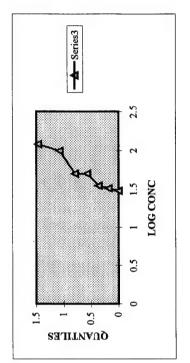


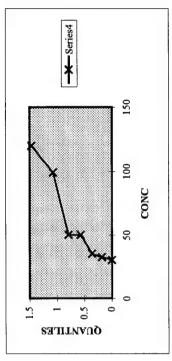
| Nitwito |          |      |          |          |
|---------|----------|------|----------|----------|
| 11110   |          |      |          |          |
| mg/l    | Log      | Rank | Prob     | Quantile |
| 0       |          | 1    | 0.111111 | -1.22    |
| 0       |          | 2    | 0.22222  | -0.765   |
| 0.00625 | -2.20412 | 3    | 0.333333 | -0.43    |
| 0.01    | -2       | 4    | 0.44444  | -0.14    |
| 0.017   | -1.76955 | 5    | 0.555556 | 0.14     |
| 0.024   | -1.61979 | 9    | 0.666667 | 0.43     |
| 0.0915  | -1.03858 | 7    | 0.777778 | 0.765    |
| 0.0945  | -1.02457 | 8    | 0.888889 | 1.22     |
|         |          |      |          |          |





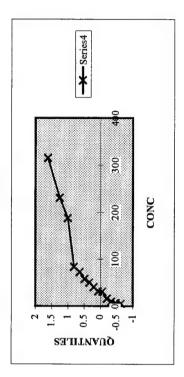
| Arsenic  |          |      |          |          |
|----------|----------|------|----------|----------|
| ug/l     | log      | Rank | Prob     | Quantile |
| 0        |          | 1    | 0.058824 | -1.57    |
| 0        |          | 2    | 0.117647 | -1.19    |
| 0        |          | 3    | 0.176471 | -0.93    |
| 0        |          | 4    | 0.235294 | -0.72    |
| 1.4      | 0.146128 | 5    | 0.294118 | -0.54    |
| 5.375    | 0.730378 | 9    | 0.352941 | -0.38    |
| 9        | 0.778151 | L    | 0.411765 | -0.23    |
| 7        | 0.845098 | 8    | 0.470588 | -0.075   |
| 8        | 0.90309  | 6    | 0.529412 | 0.075    |
| 18       | 1.255273 | 10   | 0.588235 | 0.23     |
| 21.83    | 1.33912  | 11   | 0.647059 | 0.38     |
| 26.65    | 1.425697 | 12   | 0.705882 | 0.54     |
| 30.87    | 1.48949  | 13   | 0.764706 | 0.72     |
| 31.10588 | 1.492843 | 14   | 0.823529 | 0.93     |
| 37       | 1.568202 | 15   | 0.882353 | 1.19     |
| 46       | 1.662758 | 16   | 0.941176 | 1.57     |
|          |          |      |          |          |





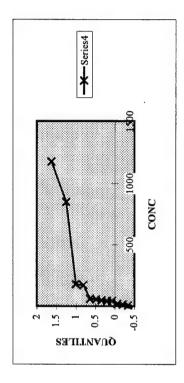
| Nickel |          |      |          |          |
|--------|----------|------|----------|----------|
| ug/l   | Log      | Rank | Prob     | Quantile |
| 0      |          | I    | 0.071429 | -1.465   |
| 0      |          | 7    | 0.142857 | -1.07    |
| 0      |          | 3    | 0.214286 | -0.79    |
| 0      |          | 4    | 0.285714 | -0.57    |
| 0      |          | 5    | 0.357143 | -0.365   |
| 0      |          | 9    | 0.428571 | -0.18    |
| 30     | 1.477121 | L    | 0.5      | 0        |
| 32.4   | 1.510545 | 8    | 0.571429 | 0.18     |
| 34.95  | 1.543447 | 6    | 0.642857 | 0.365    |
| 20     | 1.69897  | 10   | 0.714286 | 0.57     |
| 50     | 1.69897  | 11   | 0.785714 | 0.79     |
| 66     | 1.995635 | 12   | 0.857143 | 1.07     |
| 120    | 2.079181 | 13   | 0.928571 | 1.465    |

| To the second | 255           |          |
|---------------|---------------|----------|
| 1             | 0.5 prof      | NC       |
|               | 4             | TOG CONC |
|               | <b>27</b> 5:0 |          |



| Copper   |          |      |          |          |
|----------|----------|------|----------|----------|
| ug/l     | log      | Rank | prob     | quantile |
| 0        |          | 1    | 0.052632 | -1.62    |
| 0        |          | 2    | 0.105263 | -1.25    |
| 0        |          | 3    | 0.157895 | -1       |
| 0        |          | 4    | 0.210526 | -0.805   |
| 5        | 0.69897  | 5    | 0.263158 | -0.635   |
| 9        | 0.778151 | 9    | 0.315789 | -0.48    |
| 9.2      | 0.963788 | 7    | 0.368421 | -0.34    |
| 15.81176 | 1.19898  | 8    | 0.421053 | -0.2     |
| 30       | 1.477121 | 6    | 0.473684 | -0.065   |
| 30.75    | 1.487845 | 10   | 0.526316 | 0.065    |
| 40       | 1.60206  | 11   | 0.578947 | 0.2      |
| 50       | 1.69897  | 12   | 0.631579 | 0.34     |
| 57       | 1.755875 | 13   | 0.684211 | 0.48     |
| 72       | 1.857332 | 14   | 0.736842 | 0.635    |
| 82.5     | 1.916454 | 15   | 0.789474 | 0.805    |
| 187.5    | 2.273001 | 16   | 0.842105 | 1        |
| 230      | 2.361728 | 17   | 0.894737 | 1.25     |
| 315      | 2.498311 | 81   | 0.947368 | 1.62     |
|          |          |      |          |          |

|   | ٠,  |      | _   | 3    |          |
|---|-----|------|-----|------|----------|
|   | Į   | 541  |     |      | NC       |
|   |     | Ţ    | ¥   | 2    | LOG CONC |
|   |     |      | ş   |      | I        |
|   |     |      |     | ধ    |          |
| 7 | 1.5 | 0.5  | 0   | -0.5 |          |
|   | res | ILNV | 'nδ |      |          |
|   |     |      |     |      |          |



|      | quantile | -1.62    | -1.25    | 1-       | -0.805   | -0.635   | -0.48    | -0.34    | -0.2     | -0.065   | 0.065    | 0.2      | 0.34     | 0.48     | 0.635    | 0.805    | 1        | 1.25     | 1.62     |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|      | prob     | 0.052632 | 0.105263 | 0.157895 | 0.210526 | 0.263158 | 0.315789 | 0.368421 | 0.421053 | 0.473684 | 0.526316 | 0.578947 | 0.631579 | 0.684211 | 0.736842 | 0.789474 | 0.842105 | 0.894737 | 0.947368 |
|      | Rank     | 1        | 2        | 3        | 4        | 5        | 9        | 7        | 8        | 6        | 10       | 11       | 12       | 13       | 14       | 15       | 16       | 17       | 18       |
|      | log      |          |          |          |          |          |          | 0.690639 | 1.113943 | 1.22617  | 1.60206  | 1.60206  | 1.653213 | 1.740363 | 1.779055 | 2.230449 | 2.247359 | 2.926857 | 3.070038 |
| Lead | l/gn     | 0        | 0        | 0        | 0        | 0        | 0        | 4.905    | 13       | 16.83333 | 40       | 40       | 45       | 55       | 60.125   | 170      | 176.75   | 845      | 1175     |

APPENDIX D:

STATISTICAL TESTS

Confidence Intervals for Various Parameters: Using Standard Student T-Tests.

| mg/1 ND/NS 112.20 36.767 76.40 59.00 100.00 248.00 90.75 90.75 90.75 19.00 11.50 11.50 56.70 NS 36.70 128.00 11.50 11.50 11.50 250.00 250.00 250.00 | ŀ      |       | Hd      |       | IDS     | -     | Mangenese | nese  | Sodium | um    | Barıum  | ını   | Zinc    | JC .  | Sulfate | ite   |
|---|--------|-------|---------|-------|---------|-------|-----------|-------|--------|-------|---------|-------|---------|-------|---------|-------|
| 82  | mg/l   | ND/NS | mg/l    | ND/NS | mg/l    | SN/QN | mg/l      | ND/NS | mg/l   | ND/NS | l/gn    | ND/NS | l/gn    | ND/NS | mg/l    | ND/NS |
| \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\  | 37.30  |       | 6.82    |       | 1105.00 |       |           | SN    |        | SN    | 328.00  |       | 1565.00 |       | 128.00  |       |
| N N N N N N N N N N N N N N N N N N N   | 28.60  |       | 66.9    |       | 4336.67 |       |           | NS    |        | NS    | 356.00  |       | 130.50  |       | 50.63   |       |
| NS NS   | 11.76  |       | 7.08    |       | 2486.67 |       |           | SN    |        | NS    | 250.00  |       | 31.93   |       | 432.43  |       |
| NS NS   | 3.10   |       | 7.60    |       | 1400.00 |       |           | SN    |        | NS    | 76.00   |       | 400.00  |       | 630.00  |       |
| N N   | 46.00  |       | 6.46    |       | 1606.00 |       | 2.20      |       | 100.00 |       | 1000.00 |       | 84.00   |       | 380.00  |       |
| ω <sub>Z</sub> Z  | 5.01   |       |         | NS    | 3308.00 |       | 5.78      |       | 165.20 |       | 130.00  |       | 12.00   |       | 1126.00 |       |
| SZ Z  | 46.50  |       | 09.9    |       | 510.00  |       | 3.65      |       | 42.00  |       | 215.00  |       |         | NS    | 43.11   |       |
| SZ Z  | 7.20   |       | 6.95    |       | 450.00  |       | 3.45      |       | 33.00  |       | 80.00   |       | 70.00   |       | 80.50   |       |
| NS NS   | 11.90  |       | 86.9    |       | 687.50  |       | 1.34      |       | 56.50  |       | 400.00  |       | 70.00   | NS    | 45.00   |       |
| N N N N N N N N N N N N N N N N N N N   | 27.00  |       | 89.9    |       | 515.00  |       | 4.13      |       | 28.00  |       | 266.67  |       |         | NS    | 74.00   |       |
| S.  | 2.50   |       | 6.45    |       | 420.00  |       | 3.45      |       | 14.00  |       | 200.00  |       |         | NS    | 120.00  |       |
| SN.   | 0.05   |       | 7.24    |       |         | NS    | 0.02      |       | 64.00  |       |         | NS    |         | SN    | 118.00  |       |
|   |        | NS    |         | NS    |         | NS    |           | NS    |        | NS    |         | SN    | 20.50   |       |         | NS    |
|   | 28.13  |       | 09'9    |       | 1320.00 |       | 76.38     |       | 101.98 |       |         | NS    |         | NS    | 189.43  |       |
|   | 275.11 |       | 6.97    |       | 3366.00 |       | 8.30      |       | 411.20 |       | 546.00  |       | 71.26   |       | 390.95  |       |
|   | 0.30   |       |         | NS    | 8400.00 |       | 0.05      |       |        | NS    |         | NS    | 403.00  |       | 250.00  |       |
|   | 49.10  |       |         | SN    |         | NS    |           | NS    |        | NS    |         | NS    | 135.00  |       |         | NS    |
|   | 48.50  |       |         | NS    |         | NS    |           | NS    |        | NS    |         | NS    | 65.00   |       |         | NS    |
| 27.50   | 1.15   |       | 09.7    |       | 1770.00 |       |           | NS    |        | NS    |         | NS    | 1150.00 |       |         | NS    |
| 110.00  | 5.53   |       |         | SN    | 3450.00 |       | 1.50      |       |        | NS    | 4750.00 |       | 5165.00 |       |         | NS    |
| 182.50  | 100.50 |       | 06.9    |       | 3341.00 |       | 2.95      |       | 773.00 |       |         | NS    | 1150.00 |       | 1.43    | Ð     |
|   |        |       |         |       |         |       |           |       |        |       |         |       |         |       |         |       |
| Average 157.64  | 36.76  |       | 6.93    |       | 2263.05 |       | 8.71      |       | 162.63 |       | 661.36  |       | 657.70  |       | 253.72  |       |
| 184.77  | 61.53  |       | 0.36    |       | 2028.49 |       | 20.46     |       | 231.19 |       | 1252.25 |       | 1297.07 |       | 292.18  |       |
| Sample No. 20.00  | 20.00  |       | 15.00   |       | 17.00   |       | 13.00     |       | 11.00  |       | 13.00   |       | 16.00   |       | 16.00   |       |
| Freedom 19.00   | 19.00  |       | 14.00   |       | 16.00   |       | 12.00     |       | 10.00  |       | 12.00   |       | 15.00   |       | 15.00   |       |
| t <sub>(0.99,tb-1)</sub> 2.54   | 2.54   |       | 2.62    |       | 2.58    |       | 2.68      |       | 2.76   |       | 2.68    |       | 2.60    |       | 2.60    |       |
| *S/(n)^.5 104.90  | 34.93  |       | 0.24    |       | 1270.79 |       | 15.21     |       | 192.67 |       | 931.15  |       | 843.74  |       | 190.06  |       |
| Lower Limit of C.I. 52.74   | 1.83   |       | 69.9    |       | 992.26  |       | 0.00      |       | 0.00   |       | 0.00    |       | 0.00    |       | 0.00    |       |
| Upper Limit of C. I. 262.54   | 71.70  |       | 7.17    |       | 3533.84 |       | 23.92     |       | 355.30 |       | 1592.51 |       | 1501.44 |       | 443.78  |       |
| iidance 250.00  | 0.30   |       | 6.5-8.5 |       | 500.00  |       | 0.05      |       | 160.00 |       | 2000.00 |       | 5000.00 |       | 250.00  |       |
| Problem Yes   | Yes    |       | No      |       | Yes     |       | Yes       |       | Yes    |       | No      |       | %<br>N  |       | Yes     |       |

Confidence Intervals for Various Parameters: Calculated by Cohen's Method

| 1.0g (y) ug/l 82.50 82.50 82.50 6.00 6.00 1.04 50.00 1.07 187.50 2.20 30.05 2.20 37.50 2.20 315.00 2.2 | Statistics            | Cya      | Cyanide | Ars      | Arsenic |          | Nitrate    |         |          | Nitrite   |         |          | Copper   |         |          | Lead     |         |          | Nickel     |         |
|--|-----------------------|----------|---------|----------|---------|----------|------------|---------|----------|-----------|---------|----------|----------|---------|----------|----------|---------|----------|------------|---------|
| 001         36.5         18.5   |                       | mg/l     | ND/NS   | l/gu     | ND/NS   | mg/l     | ND/NS      | Log (y) | mg/l     | ND/NS     | Log (y) | l/8n     | ND/NS    | Log (y) | l/gu     | ND/NS    | Log (y) | l/gu     | ND/NS      | Log (y) |
| 001         118.5         NB         NB <th< td=""><td></td><td>0.01</td><td></td><td>26.65</td><td></td><td></td><td>NS</td><td></td><td></td><td>NS</td><td></td><td>82.50</td><td></td><td></td><td>845.00</td><td></td><td>2.93</td><td>34.95</td><td></td><td>1.54</td></th<>  |                       | 0.01     |         | 26.65    |         |          | NS         |         |          | NS        |         | 82.50    |          |         | 845.00   |          | 2.93    | 34.95    |            | 1.54    |
| 0 01         NB         30.97         NB         NB <t< td=""><td></td><td>0.01</td><td></td><td>21.83</td><td></td><td></td><td>NS</td><td></td><td></td><td>NS</td><td></td><td></td><td>ND</td><td></td><td>16.83</td><td></td><td>1.23</td><td></td><td>UN</td><td></td></t<>  |                       | 0.01     |         | 21.83    |         |          | NS         |         |          | NS        |         |          | ND       |         | 16.83    |          | 1.23    |          | UN         |         |
| No.    |                       | 0.01     |         | 30.87    |         |          | NS         |         |          | NS        |         |          | ND       |         |          | QN       |         |          | ND         |         |
| No. 8  |                       |          | ND      | 7.00     |         |          | NS         |         |          | NS        |         |          | UN       |         |          | QN       |         |          | ND         |         |
| No. 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,  |                       |          | NS      | 8.00     |         |          | ND         |         |          | ND        |         |          | QN       |         |          | QN       |         |          | ND         |         |
| 0.09         ND         0.09         ND         0.09         1.00         0.00         0.00         0.00         1.00         0.0  |                       |          | NS      | 6.00     |         |          | NS         |         |          | NS        |         | 6.00     |          | 0.78    |          | QN .     |         |          | SN         |         |
| (101)         ND         (360)         (362)         (362)         (147)         (1875)         (450)         (150)         (  |                       | 0.09     |         |          | ΔN      |          | ΩN         |         | 60.0     |           | -1.04   | 50.00    |          | 1.70    | 55.00    |          | 1.74    |          | SN         |         |
| 0.02         0.03         0.04         0.05         0.04         0.05         0.04         0.05         0.04         0.05 <th< td=""><td></td><td></td><td>QN</td><td></td><td>QN</td><td>09.0</td><td></td><td>-0.22</td><td>0.02</td><td></td><td>-1.62</td><td>40.00</td><td></td><td>1.60</td><td>40.00</td><td></td><td>1.60</td><td>50.00</td><td></td><td>1.70</td></th<>   |                       |          | QN      |          | QN      | 09.0     |            | -0.22   | 0.02     |           | -1.62   | 40.00    |          | 1.60    | 40.00    |          | 1.60    | 50.00    |            | 1.70    |
| 10.05   No.        |                       | 0.01     |         | 5.38     |         | 4.50     |            | 0.65    | 0.02     |           | -1.77   | 187.50   |          | 2.27    | 45.00    |          | 1.65    | 50.00    |            | 1.70    |
| 6 0.05         NS         NS         1.48         NS         1.48         NS         1.48         NS         NS         NS         NS         1.48         NS         NS         1.48         NS         NS         1.48         NS         NS         NS         NS         1.48         NS         1.48         NS         NS         NS   |                       | 0.02     |         |          | QN      | 0.11     |            | -0.98   | 0.01     |           | -2.20   | 30.75    |          | 1.49    | 60.13    |          | 1.78    |          | NS         |         |
| NS         NS<   |                       | 0.05     |         |          | ND      | 0.16     |            | -0.81   | 60.0     |           | -1.02   | 30.00    |          | 1.48    |          | ND       |         |          | ND         |         |
| National Plane   |                       |          | NS      |          | SN      |          | NS         |         |          | NS        |         |          | NS       |         |          | SN       |         |          | NS         |         |
| Main Class   Mai   |                       |          | NS      |          | NS      |          | NS         |         |          | NS        |         | 5.00     |          | 0.70    |          | ND       |         | 30.00    |            | 1.48    |
| 1.00   N. N. N. N. N. N. N. N. N. N. N. N. N.  |                       |          | NS      |          | NS      | 0.16     |            | -0.80   |          | NS        |         |          | NS       |         | 176.75   |          | 2.25    |          | SN         |         |
| NS   NS   NS   NS   NS   NS   NS   NS  |                       | 0.03     |         | 31.11    |         | 0.26     |            | -0.58   |          | NS        |         | 15.81    |          | 1.20    | 4.91     |          | 69.0    | 32.40    |            | 1.51    |
| NB   NB   1.00   NB   NB   NB   NB   NB   NB   NB  |                       |          | NS      | 18.00    |         |          | NS         |         |          | NS        |         | 72.00    |          | 1.86    | 13.00    |          | 1.11    |          | ND         |         |
| NB   NB   140   NS   NS   NS   NS   NS   NS   NS   N   |                       |          | ND      | 37.00    |         |          | ND         |         |          | NS        |         | 57.00    |          | 1.76    | 40.00    |          | 1.60    | 00.66    |            | 2.00    |
| NS   NS   A6   O   O   O   O   O   O   O   O   O   |                       |          | ND      | 1.40     |         |          | ND         |         |          | NS        |         | 9.20     |          | 96'0    |          | NS       |         |          | NS         |         |
| NS   46 00   6 24   0 62   0 01   ND   15886   175 00     |                       |          | NS      |          | NS      |          | NS         |         |          | NS        |         | 230.00   |          | 2.36    | 170.00   |          | 2.23    | 120.00   |            | 2.08    |
| ND   R.50   R.   |                       |          | NS      | 46.00    |         | 0.24     |            | -0.62   | 0.01     |           | -2.00   | 315.00   |          | 2.50    | 1175.00  |          | 3.07    |          | NS         |         |
| Optional Ligit         1.6994         1.6894         1.5886         1.8235         1.7148           Of Detects         0.00729         2.11.5282         0.510792         0.239976         0.634942         0.63656         0.64619           of Detects         0.00729         2.11.5282         0.510792         0.239976         0.239976         0.63692         0.63692         0.65619           of Detects         0.007         1.2         8         0.220         0.5397         0.239         0.220         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.239         0.2417         0.2417         0.2418         0.241  |                       |          | ND      |          |         | 8.50     |            | 0.93    |          | QN        |         |          |          |         |          |          |         |          |            |         |
| Of Detects         0.0000729         211,5282         0.5100792         0.5100792         0.5100792         0.5100792         0.5100792         0.5100792         0.52007         0.520  | Mean of Detects       | 0.0281   |         | 19.9359  |         | -0.3034  |            |         | -1.6094  |           |         | 1.5886   |          |         | 1.8235   |          |         | 1.7148   |            |         |
| D         5         4         4         4         4         6         6         6         6         6         6         7         7           etected         8         12         8         6         4         6         13         7         7           per offold         13         16         12         8         6         6         9         7         7           pe of ND         0.385         0.250         0.337         0.035         0.336         0.0437         0.017         0.017         0.018         0.018         0.116         0.15         0.018 <td>Variance of Detects</td> <td>0.000729</td> <td></td> <td>211.5282</td> <td></td> <td>0.510792</td> <td></td> <td></td> <td>0.239976</td> <td></td> <td></td> <td>0.334942</td> <td></td> <td></td> <td>0.490556</td> <td></td> <td></td> <td>0.056619</td> <td></td> <td></td>  | Variance of Detects   | 0.000729 |         | 211.5282 |         | 0.510792 |            |         | 0.239976 |           |         | 0.334942 |          |         | 0.490556 |          |         | 0.056619 |            |         |
| spectred         8         12         8         12         13         12         13         12         13         14         15 <th< td=""><td>No. of ND</td><td>5</td><td></td><td>4</td><td></td><td>4</td><td></td><td></td><td>2</td><td></td><td></td><td>4</td><td></td><td></td><td>9</td><td></td><td></td><td>9</td><td></td><td></td></th<>   | No. of ND             | 5        |         | 4        |         | 4        |            |         | 2        |           |         | 4        |          |         | 9        |          |         | 9        |            |         |
| upled         13         16         12         8         17         18         13           pe of ND         0.385         0.520         0.533         0.250         0.536         0.510         0.133         0.0452           pe of ND         0.385         0.520         95.037         0.447         (.36 mg/l)         0.510         0.718151         0.018         0.146         0.7678           limit (DL)         0.005         1.27633         0.4045         0.5519         0.0437         0.4477         (.36 mg/l)         0.718151         0.0146         0.7678         1.716691         1.50 mg/l         0.71678         1.716691   | No. of Detected       | 8        |         | 12       |         | 8        |            |         | 9        |           |         | 13       |          |         | 12       |          |         | 7        |            |         |
| ge of ND         0.885         0.250         0.333         0.250         0.250         0.233         0.0462           2 <sup>4</sup> /mean-DL/3         1.363         0.500         95.037         0.177         0.117         0.011         0.016         0.016         0.016         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.018         0.017         0.018   | Total Sampled         | 13       |         | 16       |         | 12       |            |         | ∞        |           |         | 17       |          |         | 18       |          |         | 13       |            |         |
| 3. (Institution Liber)         1.363         0.590         95.037         0.177         0.178 (a. mg/l)         0.518 (b. mg/l)         0.518 (b. mg/l)         0.519 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.178 (b. mg/l)         0.176 (b.  | Percentage of ND      | 0.385    |         | 0.250    |         | 0.333    |            |         | 0.250    |           |         | 0.235    |          |         | 0.333    |          |         | 0.462    |            |         |
| Limit (DL)         0.005         1         -0.37675 (42 mg/l)         -0.4437 (36 mg/l)         0.748151 (60 ug/l)         0.748151 (60 ug/l)         0.116091 (15.0 ug/l)         1.116091 (15.0 ug/l) <td>gamma=s²/(mean-DL)²</td> <td>1.363</td> <td></td> <td>0.590</td> <td></td> <td>95.037</td> <td></td> <td></td> <td>0.177</td> <td></td> <td></td> <td>0.510</td> <td></td> <td></td> <td>0.148</td> <td></td> <td></td> <td>0.195</td> <td></td> <td></td>   | gamma=s²/(mean-DL)²   | 1.363    |         | 0.590    |         | 95.037   |            |         | 0.177    |           |         | 0.510    |          |         | 0.148    |          |         | 0.195    |            |         |
| Parameter         0.7853         0.34865         0.34765         0.34765         0.7678         0.7678           1 Mean         0.039955         12.27633         -0.3439         -1.203         1.30664         0.04553         1.301188           1 Skd Dev         0.0339801         18.83344         0.16769         0.84485         0.750535         1.446023         0.528651           1 Skd Dev         1.260         2.718         2.598         2.583         2.567         2.561           1)**S(n)**5         0.025201         1.28342         0.562391         0.895501         0.470187         0.470187         0.874913         0.333092           mit of C. 1.         0.03546         0.218491         1.63831         0.33055         0.07971         0.43667         0.874913         0.506096         8.092           mit of C. 1.         0.03154         0.218491         1.65831         0.33075         0.492608         0.77018         0.894825         0.906096         8.09209           mit of C. 1.         0.03164         0.0         0.492608         0.77018         0.77041         6.18677         0.906096         8.09209           mit of C. 1.         0.0316         0.245060         0.77018         0.77041         0.77048  | Detection Limit (DL)  | 0.005    |         | 1        |         | -0.37675 | (.42 mg/l) |         | )        | .36 mg/l) |         | 0.778151 |          |         | 0        |          |         |          | 15.0 ug/l) |         |
| Moean   0.009965   12.27633   0.3439   0.1203   0.4485   0.130864   0.045858   0.045858   0.130188   1.301888   1.301888   1.301888   1.301888   1.301888    | Cohen's Parameter     | 0.7853   |         | 0.4045   |         | 0.5519   |            |         | 0.34865  |           |         | 0.34765  |          |         | 0.4813   |          |         | 0.7678   |            |         |
| Skid Dev   0.033891   18.88304   0.116769   0.84485   0.750535   1.446023   0.528651   1.228451   1.2288451   1.2288451   1.2288451   1.2288451   1.2288451   1.2288451   1.2288451   1.2   | Corrected Mean        | 0.009965 |         | 12.27633 |         | -0.3439  |            |         | -1.203   |           |         | 1.306864 |          |         | 0.945858 |          |         | 1.301188 |            |         |
| of Freedom         12         15         11         16         17         18         12           1)         2.681         2.681         2.583         2.587         2.567         2.681           1)*S(M)*S         2.6221         2.6731         0.895501         0.895501         0.895501         0.874913         0.893902           mit of C.1.         0.01524         0.218491         1.65381         0.20950         0.107971         0.836575         0.070943         1.17458         0.508096         8.092           mit of C.1.         0.035166         0.218491         1.653831         0.0492608         0.492608         0.177051         59.84825         0.177458         0.508096         8.092           Alo         No  | Corrected Std Dev     | 0.033891 |         | 18.88304 |         | 0.716769 |            |         | 0.84485  |           |         | 0.750535 |          |         | 1.446023 |          |         | 0.528651 |            |         |
| 1)         2.681         2.681         2.567         2.681         2.  | Degrees of Freedom    | 12       |         | 15       |         | 11       |            |         | 7        |           |         | 16       |          |         | 17       |          |         | 12       |            |         |
| DPS(ID)*-S         0.025201         12.28342         0.562391         0.8895501         0.470187         0.470187         0.874913         0.333092           mit of C.1.         -0.00754         -0.00708         -0.96629         0.124082         -2.0885         0.007971         0.885677         6.865575         0.070945         1.17748         0.908096         8.092           mit of C.1.         0.031649         1.63831         -0.3075         0.492608         1.777051         59.84825         1.638677         6.18677         6.18677         1.694281         49.46           ACL or Guidance         0.2         50         No   | t(0.99,n-1)           | 2.681    |         | 2.602    |         | 2.718    |            |         | 2.998    |           |         | 2.583    |          |         | 2.567    |          |         | 2.681    |            |         |
| mit of C.1.         -0.01524         -0.00708         -0.20629         0.124082         -2.0085         0.007971         0.836677         6.865575         0.070945         1.177438         0.0908096         8.092           mit of C.1.         0.035166         24.52675         0.218491         1.63831         -0.3073         0.492608         1.777051         59.8825         1.820771         66.18677         1.694281         49.46           ICL or Guidance         0.2         50         No         No <t< td=""><td>t(0.99,n-1)*S/(n)^.5</td><td>0.025201</td><td></td><td>12.28342</td><td></td><td>0.562391</td><td></td><td></td><td>895501</td><td></td><td></td><td>0.470187</td><td></td><td></td><td>0.874913</td><td></td><td></td><td>0.393092</td><td></td><td></td></t<>  | t(0.99,n-1)*S/(n)^.5  | 0.025201 |         | 12.28342 |         | 0.562391 |            |         | 895501   |           |         | 0.470187 |          |         | 0.874913 |          |         | 0.393092 |            |         |
| nut of C. 1.         0.035166         24.55975         0.218491         1.653831         -0.3075         0.492608         1.777051         59.84825         1.820771         66.18677         1.694281         49.46           ACL or Guidance         0.2         50         10         10         15         15         15         15         15         15         15         10  | Lower Limit of C.I.   | -0.01524 |         | -0.00708 | ,       |          | 0.124082   |         | -2.0985  | 0.007971  |         | 0.836677 |          |         | 0.070945 |          |         | 0.908096 | 8.092749   |         |
| ACL or Guidance         0.2         50         10         1         1000         15         No           No         No         No         No         No         No         No         No   | Upper Limit of C. I.  | 0.035166 |         | 24.55975 |         |          | 1.653831   |         |          | 0.492608  |         | 1.777051 | 59.84825 |         | 1.820771 | 66.18677 |         | 1.694281 | 49.46302   |         |
| No No Yes Yes  | MCL, SMCL or Guidance |          |         | 90       |         |          | 10         |         |          | 1         |         |          | 1000     |         |          |          |         |          | 100        |         |
|  | Problem               | No       |         | No       |         | -        | No.        |         |          | 92        |         |          | No       |         |          | Yes      |         | _        | ٩          |         |

## Confidence Interval for Cadmium: Using Aitchinson's Method.

| Statistics                  | Cadn     | nium  |
|-----------------------------|----------|-------|
|                             | ug/l     | ND/NS |
|                             |          | ND    |
|                             |          | ND    |
|                             |          | ND    |
|                             |          | ND    |
|                             |          | ND    |
|                             | 0.13     |       |
|                             | 4.00     |       |
|                             | 6.00     |       |
|                             | 10.50    |       |
|                             | 10.67    |       |
|                             | 6.00     |       |
|                             |          | NS    |
|                             |          | ND    |
|                             | 512.88   |       |
|                             | 10.05    |       |
|                             |          | ND    |
|                             |          | ND    |
|                             | 1.79     |       |
|                             | 20.00    |       |
|                             | 25.00    |       |
| No. of ND (d)               | 8        |       |
| No. of Detects              | 11       |       |
| Total Sampled (n)           | 19       |       |
| Mean of Detected Values     | 55.18    |       |
| Variance of Detected Values | 23098.54 |       |
| Adjusted Mean               | 31.94798 |       |
| Adjusted Variance           | 13616.07 |       |
| Adjusted Std Dev            | 116.6879 |       |
| Degrees of Freedom          | 18       |       |
| t(0.99,n-1)                 | 2.552    |       |
| t(0.99,n-1)*S/(n)^.5        | 68.31715 |       |
| Lower Limit of C.I.         | -36.3692 |       |
| Upper Limit of C. I.        | 100.2651 |       |
| MCL, SMCL or Guidance       | 5        |       |
| Problem                     | Yes      |       |

## Nonparmetric Confidence Intervals for Selected Compounds

| Statistics           | Chro   | omium      | Me   | rcury    | Si    | ilver      |
|----------------------|--------|------------|------|----------|-------|------------|
|                      | ug/l   | ND/NS      | ug/l | ND/NS    | ug/l  | Rank       |
|                      | 0.00   | 1          | 0    | 1        | 0     | 1          |
|                      | 0.00   | 2          | 0    | 2        | 0     | 2          |
|                      | 0.00   | 3          | 0    | 3        | 0     | 3          |
|                      | 0.00   | 4          | 0    | 4        | 0     | 4          |
|                      | 0.00   | 5          | 0    | 5        | 0     | 5          |
|                      | 0.00   | 6          | 0    | 6        | 0     | 6          |
|                      | 0.00   | 7          | 0.00 | 7        | 0     | 7          |
|                      | 0.00   | 8          | 0    | 8        | 0     | 8          |
|                      | 0.00   | 9          | 0    | 9        | 0     | 9          |
|                      | 0.00   | 10         | 0    | 10       | 10.35 | 10         |
|                      | 5.67   | 11         | 0    | 11       | 17.5  | 11         |
|                      | 14.25  | 12         | 0.16 | 12       |       |            |
|                      | 16.00  | 13         | 0.5  | 13       |       |            |
|                      | 20.68  | 14         | 0.5  | 14       |       |            |
|                      | 20.80  | 15         | 5    | 15       |       |            |
|                      | 26.67  | 16         |      |          |       |            |
|                      | 61.17  | 17         |      |          |       |            |
|                      | 175.00 | 18         |      |          |       |            |
|                      |        |            |      |          |       | -          |
| M**=                 |        | 15         |      | 13       |       | 10         |
| n+1-M=               |        | 4          |      | 3        |       | 2          |
| Confidence Interval= |        | (0, 20.80) |      | (0, 0.5) |       | (0, 10.35) |
| MCL (ug/l)=          |        | 100        |      | 2        |       | 100*       |
| Potential Risk?      |        | No         |      | No       |       | No         |

<sup>\*</sup> This is a Secondary Drinking Water Limit

<sup>\*\*</sup>  $M = n/2 + 1 + z_{0.99}(n/4)^{.5}$ , from the Statistical Analysis of Ground-Water Monitoring Data, EPA, Office of Solid Waste